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An Introductory Address
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THE THIRD EYELID.

Delivered at the Middlesex Hospital on Oct. 15th, 1919,

BY SIR JOHN BLAND-SUTTON, F.R.C.S. ENG.,
SURGEON TO THE HOSPITAL.

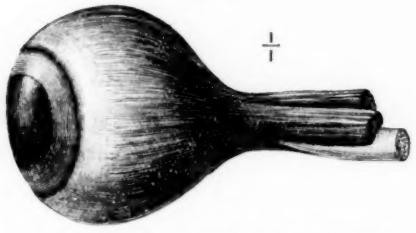
MR. PRESIDENT AND GENTLEMEN,—The Fates have been kind and allowed me a little leisure to take up a study that beguiled me in my early days. As a teacher of anatomy I took a keen interest in the metamorphoses of muscles, and I will attempt to tempt freshmen, some of whom may regard practical anatomy with distaste, perhaps with disgust, to study some remarkable changes in the muscles of the orbit, and though they are not mythic fancies, like the metamorphoses described by Ovid, some, at least, are as wonderful and rest on a solid foundation of fact. I want to encourage the student of human anatomy to realise that apart from the practical value of a knowledge of human anatomy to physicians and surgeons there is an aspect of anatomy that will lead him into some fascinating realms of speculative science. A striking example of this occurs in the muscles that move the eyelids of reptiles, birds, and beasts.

THE MUSCLES OF THE ORBIT.

Can anyone dissect the orbit without feeling a deep interest in the neat set of anatomical structures it contains? A little anatomical world! The study of the morphology of its muscles increases the interest. The muscles form two sets—one set moves the globe and the other the lids. Those that move the globe number six, four straight and two oblique. The straight muscles, from their position in man's orbit, are known as rectus superioris, rectus inferioris, rectus internus, and rectus externus. These, according to their position, move the eyeball upwards, downwards, inwards, and outwards. The oblique muscles produce rotatory movements, and the complex movements occurring from the combined actions of the oblique and straight muscles have led to much controversy and speculation.

The straight muscles are thin straps arising around the optic foramen, at the apex of the orbit, and are inserted into the sclerotic coat of the eye near the margin of the cornea. They form a hollow cone around the optic nerve. The oblique muscles lie outside this muscular cone. The superior oblique is sure to attract attention because it threads a neat fibrous pulley at the inner (nasal) corner of the orbit; this pulley deflects it at right angles to be inserted on the globe, towards the outer part of its periphery. The inferior

FIG. 1.



Eye of sheep showing the retractor bulbi muscle.

oblique is a short muscle arising from the floor of the orbit at a spot diagonally opposite to the pulley of the superior oblique.

A remarkable feature of the orbital muscles is their monopoly of three cranial nerves. The third cranial nerve, known as motor oculi, supplies the internal, inferior, and superior rectus, as well as the inferior oblique and the levator of the upper lid. The fourth cranial nerve, trochlearis, is monopolised by the superior oblique, and the sixth cranial nerve, abducens, goes exclusively to the external rectus.

Compared with the majority of vertebrates, man has a small number of muscles in his orbit. The six muscles just described are constant. There is in addition a long muscle to raise the upper lid. Man and monkeys possess only two eyelids, but many mammals, birds, reptiles, lizards, and amphibians possess three. The third eyelid, a very plastic membrane anatomically and morphologically, is moved by an interesting set of muscles lodged in the orbit. The upper

FIG. 2.

Head of shoebill. The insets show the eye in partial and complete eclipse.

and lower lids are moved by a simple muscular mechanism. The upper lid, very movable in man, is raised by its special muscle, *levator palpebræ superioris*. The lower lid is not very mobile and lacks a depressor; both lids are closed by a muscle with elliptical fibres—the *orbicularis palpebrarum*, a muscle of expression, supplied by the facial nerve. In birds the lower lid is very mobile and has a well-marked depressor muscle, corresponding in shape, dimensions, and power to man's levator.

The muscle that moves the third lid may be studied in its simple condition in a horse or a sheep. When the levator and the four straight and two oblique muscles are removed a funnel-shaped muscle surrounding the optic nerve will be exposed. This is the retractor bulbi, and as it resembles a cave lodging the optic nerve it is also called the choanoid muscle.

THE RETRACTOR BULBI.

This muscle arises from the apex of the orbit in common with the straight muscles. Its origin is tendinous and narrow, but as the muscle advances along the orbit it spreads out like the gamopetalous corolla of a primrose and envelops the optic nerve, which resembles the style; the expanded portion of the muscle is inserted into the sclerotic coat of the eye within the embrace of the four straight muscles. (Fig. 1) It is supplied by the motor oculi. When the retractor bulbi acts it draws the eyeball into the orbit and at the same time the third eyelid, or nictitating membrane slips across the cornea. When the muscle relaxes, the membrane, being elastic, retreats and refolds itself on the nasal side of the orbit, like a folding blind or shutter. Veterinary anatomists teach that when the

FIG 3.

Head of turkey. The insets show the pyramidalis and quadratus; also the termination of the tendon in the nictitating membrane. The relations of the tendon are also shown in the large figure.

retractor draws the globe backwards the pressure causes the soft fat within the orbit to bulge forwards and thus push the nictitating membrane over the eye. Whichever explanation may be offered this at least is true: The retractor muscle is responsible for the movement of the membrane across the eye. When a horse is suffering from tetanus it is well known that if the eyelids be opened during a spasm the nictitating membrane will be found spread in front of the cornea.

There is no retractor bulbi in man's orbit, but on careful dissection a fibrous funnel-shaped tunic will be found lying within the embrace of the four straight muscles, intimately associated with them, and embracing the optic nerve. The anterior portion of the tunic spreads out on the posterior part of the sclerotic repeating the method of insertion of the retractor bulbi. This tunic, or capsule, was described by the French anatomist and surgeon Tenon, a hundred years ago; it is named after him, Tenon's capsule. A critical examination of this capsule in the orbit of man and monkeys convinces me that it is the degenerate representative of the retractor bulbi as surely as the little pleat of mucous membrane, known as the semilunar fold, is the vestige, or remnant, of the third eyeball.

THE MUSCLES OF THE THIRD EYELID.

The muscular mechanism of the third eyelid or nictitating membrane of birds is easily studied in a turkey, owl, eagle, or ostrich. The membrane is neatly folded in the nasal side of the orbit and lies between the eye and its lids; it sweeps across the cornea at right angles to the eyelids. A special gland supplies fluid to facilitate its movement. It is amusing to watch the movements of this membrane, especially in big birds. In the owl and shoebill (Fig. 2) it is pearly white; the movements are very deliberate and give these birds a weird appearance. The shoebill is very grotesque with its huge bill, feathery crest, and large eyes, but when the nictitating membrane glides across the eye like a movable shade on a lamp, or more slowly producing crescent shapes resembling the phases of the moon, the varying shapes are singularly attractive and unforgettable.

The muscles that work the nictitating membrane are lodged within the orbit and attached to the globe; they can be easily dissected in big birds like rooks, owls, or turkeys. Two muscles, known as the pyramidalis and the quadratus, move the membrane. The quadratus arises from the sclerotic above the optic nerve, and its narrowest border, the one nearest the optic nerve, forms a sling. (Fig. 3.) The pyramidalis or nictitator muscle, arises from the nasal side of the sclerotic and ends in a long neat tendon that plays in a loop or sling formed by the quadratus; it then winds round the convexity of the globe under the conjunctiva, and ends in the lower angle of the nictitating membrane. In fact the free border of this membrane may be described as the terminal expansion of the tendon of the pyramidalis. The muscular sling formed by the quadratus not only facilitates the action of the pyramidalis, but prevents contact of the tendon and the optic nerve. When the pyramidalis contracts it pulls the membrane over the eye; the membrane retracts and refolds by its own elasticity.

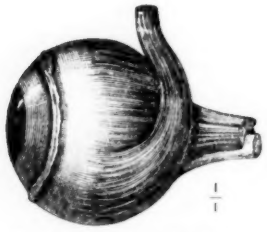
CROCODILES.

In the crocodile the nictitating membrane is transparent, and when the brute is under water, though the membrane is drawn across the eye, he can watch an enemy or an intended victim with advantage. Paraphrasing "Alice in Wonderland":—

> Quite unconcerned he seems to lie,
> Moves neither tail nor claws,
> But when he winks that watchful eye
> The prey is in his jaws.

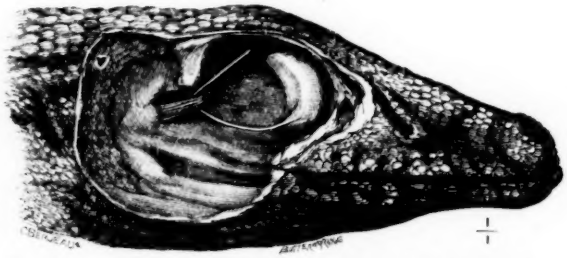
In the crocodiles and alligators the third eyelid is drawn across the eye by a powerful nictitator, which arises from the nasal side of the sclerotic and extends as a thick muscle half across the circumference of the globe. (Fig. 4.) It ends, as usual, under the conjunctiva, in the lower corner of the third eyelid.

FIG. 4.



Eye of an alligator, showing the powerful muscle that moves the third eyelid and the retractor bulbi.

FIG. 5.



The orbit of a monitor, *Varanus salvator*. The eye has been removed to show the tendon representing the pyramidalis and its relation to the nictitating membrane, and a portion of the bursalis muscle. (Museum Royal College of Surgeons.)

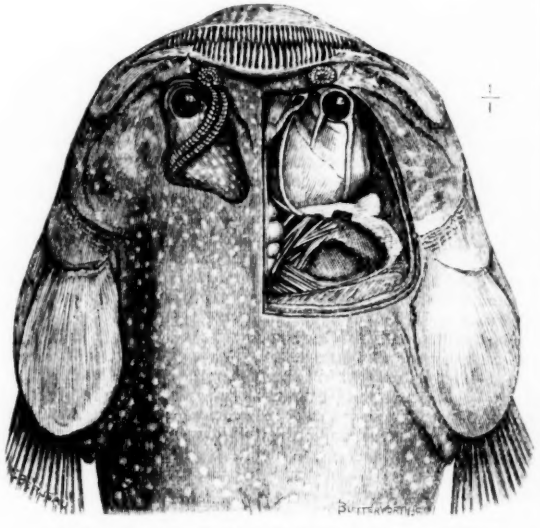
LIZARDS.

The muscles which move the nictitating membrane of lizards are even more modified than those of birds. In some lizards the eyes are protected by special shields and plates developed from scales and skin. *Ablepharus*, a lizard of the Transcaspian Desert, has the lower eyelid fused with the upper; it is transparent and, like a window, lets in light, but excludes sand. This modification of the eyelids is of use to lizards living among sand. When the South African Force

occupied Luderitzbucht (now Bothaland) in 1914, the dust of that remarkable sandy, diamond-strewn desert, blown by the prevailing wind, proved so troublesome that the eyes of the transport mules required protection by goggles.

In lizards a long slender tendon fixed to the roof of the orbit passes in the usual fashion to the lower corner of the nictitating membrane. (Fig. 5.) At the level of the optic nerve this tendon threads a sling in the bursalis muscle, which muscle represents the retractor bulbi of mammals; it

FIG. 6.



Orbit of the Stargazer, dissected to show the electric muscle.

arises from the back of the orbit, runs parallel with the optic nerve, and is inserted into the sclerotic coat of the eye. When the bursalis contracts it acts on the tendon and draws the nictitating membrane across the eye. It is a rare arrangement for a muscle to be inserted into the tendon of another muscle. There is an example in man in his foot: the muscle is called accessorius.

The pyramidalis is curiously modified. In crocodiles it is relatively big and muscular throughout. In birds it is one-fourth muscle and three-fourths tendon. In lizards the pyramidalis, entirely represented by a tendon, is activated by the retractor (bursalis) muscle. In sheep and many mammals the retractor works the nictitating membrane indirectly by acting on the globe. In man it is represented by a fibrous funnel that serves as the wall of a lymph-channel. In a fish, *Astroscopus*, some of the orbital muscles become electric organs.

ELECTRIC MUSCLES IN THE ORBIT.

The contractile substance of muscles is structureless and enclosed in a husk, called the sarcolemma. The jelly in each muscle husk receives the terminal of a motor nerve and serves as a means for the discharge of the force developed in nerve cells. Embryologists have discovered that in spite of the differences in structure of muscle cells and nerve cells they have the same origin but nerve cells are modified to originate impulses which are conducted by the nerves and discharged by the muscles.

Organs are not strictly adapted to one purpose; they have a main function and subsidiary functions. Changes may gradually affect an organ and a secondary function become dominant. This happens to a surprising degree in some fishes, for definite tracts of muscle are so modified that the electric property predominates. In such fishes the electrical muscles, like ordinary muscles, are under voluntary control and become exhausted by use.

Electric muscles exist in several fishes—torpedo, skate electric eel (which is not an eel), the stargazer, and the mormyr, a fish of peculiar shape living in the Nile. It was venerated by the ancient Egyptians and depicted on monuments. The proof that electric organs are modified muscles is furnished by the skate. In this fish the electric muscles lie in the tail. When the skate is young and like a big tadpole its electric organs are muscles, and Ewart succeeded in tracing the transformation of the muscle cells into electric cells.

The eyes of the stargazer are on the top of its head and the mouth is in such a position that, without knowledge of the cunning contrivance in the orbits, it would not be easy to understand how this fish secures food. Each orbit is roofed with a patch of soft skin, and this covers an electric organ. (Fig. 6.) The fish lies in the sand, and small fishes passing over it, paralysed by an electric shock, tumble into its open mouth. In an example dissected by Dahlgren the stomach contained a number of small swiftly swimming fishes, such as young herring and mackerel. The electric organ lies in the midst of the orbital muscles, and receives a large branch from the third nerve and branches from the trigeminus (Sylvester).

Progress in the acquisition of reliable knowledge concerning life depends on accurate instruments. For example, the minute structure of muscle was unknown before the invention of the microscope, and the elucidation of the physics of muscular contraction required the assistance of delicate measuring apparatus. An accurate knowledge of animal heat was obtained by the use of a reliable and delicate heat measurer, the thermometer, an instrument which proved that animals have within themselves a source of heat. To-day clinical thermometers are as common in nurseries as the toy called Noah's Ark. John Hunter, when he laid by experiments controlled by Ramsden's reliable thermometers, the foundations of modern knowledge on this important matter, never imagined that muscles are the chief source of animal heat.

The study of the muscles concerned in the movements of the third eyelid may cause you to reflect deeply on the absorbing subject of the physiology of muscles. Such a study may lead some of you to make discoveries in physics and neurology that will one day make the world gape with astonishment.

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SEROLOGICAL DIFFERENCES BETWEEN THE BLOOD OF DIFFERENT RACES.

THE RESULT OF RESEARCHES ON THE MACEDONIAN FRONT.*

BY DR. LUDWIK HIRSCHFELD,
DOZENT AT THE UNIVERSITY OF ZURICH;
AND
DR. HANKA HIRSCHFELD,
OF THE CENTRAL BACTERIOLOGICAL LABORATORY, ROYAL SERBIAN ARMY.

Race Problems and Researches in Immunisation.

IT is a well-known fact that it is possible to produce antibodies by injecting an animal of one species with the red blood corpuscles of an animal of a different species. These antibodies, which we call hetero-antibodies, are capable of reacting with the erythrocytes of all representatives of the species used for immunising. A rabbit immunised with the blood of a man of any race will produce agglutinins or hæmolysins which can influence to a greater or lesser degree the blood corpuscles of men of any race. The hetero-antibodies are thus specific for a species and cannot bring us nearer to the solution of the race problem.

But, as Ehrlich showed in goats and von Dungern and Hirschfeld[1] in dogs, we do possess a means of finding serological differences within a species. This is effected by immunisation *in the species*. The reason for this can be explained in a few words. Those antigen properties which are common to the giver and receiver of blood cannot give rise to any antibodies, since they are not felt as foreign by the immunised animal. The

* Paper read before the Salonika Medical Society, June 5th, 1918, and submitted to us for publication in September, 1919.

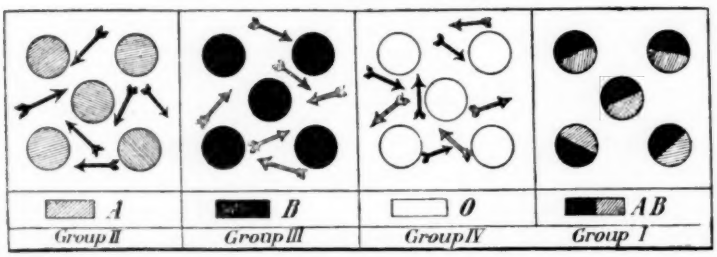
[1] Von Dungern: Münchener medizinische Wochenschrift, 1911. Von Dungern and Hirschfeld: Zeitschrift für Immunitätsforschungen, 1911, Comm. I., II., III.

antibodies produced within the species which we call iso-antibodies do not, therefore, act against the whole of the antigen properties of the species, but only against the differences between the blood of the animal which provides the blood for injection and that of the recipient. The iso-antibodies thus do not influence all representatives of the species, but only the blood used for injection and other kinds of blood similar to it. If we inject into dogs the blood of other dogs it is in many cases possible to produce antibodies. By means of these antibodies we have been able to show that there are in dogs two antigen types. These antigen types, which we recognise by means of the iso-antibodies, we may designate biochemical races.

It was, therefore, clear to us from the beginning that we could only attack the human race problem on serological lines if we could succeed in making use of antibodies of this kind, for the iso-antibodies alone are capable of selecting from the whole of the biochemical elements which serologically characterise human blood as such those elements that are characteristic of the blood of only a part of the human species.[2]

Such a differentiation of the human species is now possible by means of the iso-agglutinins first analysed by Landsteiner. If the serum and the blood corpuscles of different pairs of human beings are brought together agglutination sometimes occurs. Accurate analysis of the agglutinable properties of the blood and of the agglutinating properties of the serum showed that this phenomenon has nothing to do with disease. It depends on the following physiological facts. There are present in human blood two agglutinable properties, which, however, are not equally marked in all individuals. In the serum there is never present an agglutinin reacting with its own blood, but always an agglutinin which reacts with that property which is absent in that particular blood. As has often been pointed out in the literature of the subject, these properties are of great importance in blood transfusion, for a blood must never be injected which can be agglutinated by the recipient. Either of the two agglutinable properties may be present or both together, or both may be absent, and we can therefore distinguish four different combinations in man. In the literature of the subject we therefore most often find the statement that there are in the human species four different groups. But since we have, indeed, four groups but only two agglutinable properties, von Dungern and Hirschfeld[1] introduced another definition which is shown in the accompanying table. (Table I.) They

TABLE I.—*Landsteiner's Law of Iso-agglutinins.*



called the agglutinable property, which is common in Central Europe, A, the other, which is rare in Central Europe, B. In the figure the blood corpuscles possessing the A property are shown shaded, those with the B property are black. Landsteiner's rule lays down that there are always present in the serum agglutinins against the agglutinable property which is absent in the blood corpuscles of the same blood. If the individual has in the blood corpuscles the A property, he has in his serum agglutinin anti-B, and vice versa. These agglutinins are represented diagrammatically by arrows corresponding with the agglutinable property, the anti-A being shaded, the anti-B black. We see in the first square of the figure the shaded red blood corpuscles A surrounded by the black arrows anti-B, while in the second square are the black blood corpuscles B with the shaded anti-A agglutinins. In the third square we see the non-agglutinable red blood corpuscles which possess neither A nor B property, called by von Dungern and Hirschfeld the Group O. In accordance with Landsteiner's rule that in the blood there are always agglutinins against the qualities lacking in the corpuscles we have here both the shaded anti-A and the black anti-B arrows. Finally, in the fourth square are represented the red corpuscles, which have both A and B properties, and accordingly no agglutinins. Below our diagram we have given the classification used by English writers on the subject. The English Group I. corresponds to our A B, Group II. is our A, and Group III. our B. As against Mosse, we wish to point out that Group I. does not represent any special individuality, but merely, as can easily be proved by absorption experiments, the combination of the properties A and B. For the differentiation of the groups, therefore, we require not three, but only two sera, A and B.

Results of Experiments.

What biological significance, then, has this peculiar differentiation of the blood within the human species, and how are these marks of the biochemical race inherited? Von Dungern and Hirschfeld first undertook experiments on the inheritance of these characteristics in dogs, and found that the biochemical properties of the blood are sometimes inherited and sometimes disappear in the off-spring. They established, further, that the anatomical and biochemical characteristics are inherited independently of one another. Young dogs which had the general structure and colour of the mother showed the agglutinable properties of the father and vice versa.

Researches on the inheritance of the bio-chemical group properties in man as differentiated by means of Landsteiner's iso-antibodies permitted von Dungern and Hirschfeld to come to an important conclusion as to the nature of these properties. We succeeded in showing that the A and B properties are generally inherited, but sometimes may disappear in the offspring. When the parents had A or B we found sometimes the Group O occurring in the children. On the other hand, we never found either A or B property in a child when it was absent in the parents. This observation will permit under certain circumstances of medico-legal decisions being made in order to find the real father of a child. If we find in a child either A or B property when it is absent in the mother it must be present in the real father.

The analysis of our numerical results proved that we can apply Mendel's law to the inheritance of the biochemical properties A and B. Since the A and B properties may disappear but never appear spontaneously, we can regard them according to Mendel's law as those properties which once present in the germ-plasm must also be outwardly visible. Mendel, as we know, named such a property or quality, which always gives the species its outward appearance, the dominant, while the absence of the property (which property may appear in children although absent in the parents) is considered as latent or recessive, and is set in contra-distinction to the dominant. If, for example, the dominant is *red* the Mendelian quality or property antagonistic to it—e.g., *white*—is described as *non-red*. If we introduce the Mendelian terminology we can in our cases speak of non-A and non-B. With certain premises, which are discussed in the second part of von Dungern and Hirschfeld's paper, the figures showing the frequency of occurrence of A and B in central Europe can be brought into harmony with Mendel's law, the properties A and B being recognised as dominant, the properties non-A and non-B (the combination of which gives Group O) as recessive. A and non-A thus may be regarded as Mendelian pairs and similarly B and non-B.

What are the laws, then, governing the relationships of A and B with each other. The calculation showed that they simply fit in with the calculation of probability according to which A and B can come together when they do not influence each other. When A, for instance, occurs in half of all cases and B in one-tenth, A B will be found together in about one-twentieth—i.e., in 5 per cent. Experience has shown that the occurrence of Group I. (our Group A B) approximates to this figure. If, therefore, Landsteiner's rule is regarded from the broad biological point of view it can be stated as follows: There are within the human species four properties of blood, A, non-A, B, and non-B.

[2] This only applies to non-absorbed sera.

A and non-A, B and non-B behave to each other according to Mendel's law, while A and B, non-A and non-B do not influence one another. Experience has shown that the inheritance of the biochemical blood properties in man is not influenced by sex and does not correspond with the inheritance of anatomical qualities (family resemblance, &c.), so that we have to do with an independent heredity. The agglutinable properties appear already in embryonic life; we have observed them in a six-months' fœtus. We have succeeded in finding these properties in the placental blood even when they were absent in the mother. The iso-agglutinins, however, do not appear until the second year of life. We can confirm Landsteiner's observation that these group-properties have nothing to do with disease. They appear also not to alter with time. We ourselves possess the same groups and agglutinins which we found in our blood eight years ago in spite of the fact that one of us has had typhoid and now suffers from chronic malaria. The experiments in heredity, also, point to the constancy of the biochemical properties of the blood. There exist, indeed, weakly agglutinable blood corpuscles and weakly agglutinating sera. An accidental coming together of these might simulate Group O where in reality A or B was present.

We have often examined hundreds of specimens of blood with 10 different sera and found mostly only quantitative differences between the different A and B sera for the agglutinin is seldom absent. Rarely there are to be found certain anti-A (Group B) sera which agglutinate the corpuscles of rather more individuals than other sera. The corresponding groups are distinguished by von Dungern and Hirschfeld as Large-A and Small-a. We have therefore always used several sera for the examination of a people or a race, and, on the other hand, always used the same set of sera for the examination of different races. We have never observed that malaria has any influence on the agglutinations. The clumping in the blood of anæmic patients has nothing to do with the agglutinations, as one of us has succeeded in proving.[3] The red blood corpuscles always sink in their own plasma as soon as their number is so small that they cannot support each other. The rate of sinking thus runs parallel with the anæmia. It seemed, therefore, that it would be of interest to make use of the properties of blood, as defined by Landsteiner's rule, to form an anthropological criterion for the discovery of hitherto unknown and anatomically invisible relationships between different races. Through the accident of the war we happened to come to a part of the globe where more than elsewhere various races and peoples are brought together, so that the problems we are discussing, which otherwise would have necessitated long years of travel, could be brought in a relatively short time nearer to solution.

Technique.

The technique is as follows. We add a few drops of blood from the ball of the finger to a mixture of sodium chloride and sodium citrate solution (normal saline 9 parts, 2·5 per cent., Na citrate 1 part). A drop of the blood mixture is brought in contact in a small test-tube with a drop each of the A and B sera, of which the activity and specificity have always been established by a control experiment. The result was never read off in less than half an hour—a point of great importance, as particularly Group B is but slowly agglutinated. We used only Serbians as providers of serum. For each race several sera are used, but the same set of sera for all races. Our material consists for the most part of soldiers from various districts. This is to be regarded as a very favourable circumstance, since they are mostly unrelated to each other, so that the possibility that the frequency of a group might depend on family relationship is excluded. The refugees, as our statistics for the Jewish race particularly show, give evidence of great individual differences in the first, second, and other hundreds examined, so that the results must be confirmed by tests on more extensive material. The exact statistics with regard to the different tribes, provinces, anatomical structure, &c., will appear in an anthropological journal. We examined 500–1000 persons of each race. For the Germans we quote from memory the results of von Dungern and Hirschfeld as the statistical table for these is unfortunately not to hand. For the Austrians we use the Vienna statistics of L. Landsteiner. For the Jews we used the refugees from Monastir belonging to a people which came from Spain about 400 years ago. For the Greeks we examined 300 soldiers from Old Greece and the Islands and 200 refugees from Asia Minor and Thrace. For the Turks we used Macedonian Mahommedans. These last must certainly contain a large admixture of Slav blood, and the statistics should be confirmed in Turkey. We wish to emphasise particularly that all these people, except the Indians, who are as a nation for the most part vegetarians, are receiving exactly the same food and are exposed to the same hardships and diseases, so that it would not be correct to refer the great differences we have found in the frequency of A and B Groups to special climatological or pathological conditions.

[3] L. Hirschfeld: Korrespondenzblatt für Schweizer Aerzte, 1917.

Statistical Analyses.

We wish to point out as the first important fact that we found the Groups A and B present in all races examined. Table II. shows the percentage of A and B. The figures in the right-hand column of Table II. represent the total numbers of each race examined. A glance at the table shows that we find marked differences in the incidence of A and B in the different races. From the English onward we see that A always diminishes, whereas B increases.[4] In order to give an exact analysis we will first look at our data from the point of view developed by von Dungern and Hirschfeld in the second part of their paper.[5] The group A B was regarded by them as the accidental coming together of A and B. If we analyse our statistics from this point of view we reach the following figures: If A is present in 43·4 per cent. and B in 7·2 per cent. For the calculation of probability we must multiply 43·4/100 by 7·2/100, which gives 301/10,000 = 3·1 per cent. In reality we found 3·1 per cent.

TABLE II.

—	A in per cent.	B in per cent.	A B in per cent.	O in per cent.	Total No. examined.
English ...	43·4	7·2	3·0	46·4	500
French ...	42·6	11·2	3·0	43·2	500
Italians ...	38·0	11·0	3·8	47·2	500
Germans...	43·0	12·0	5·0	40·0	ca.500
Austrians	40·0	10·0	8·0	42·0	?
Serbs... ...	41·8	15·6	4·6	38·0	500
Greeks ...	41·6	16·2	4·0	38·2	500
Bulgarians	40·6	14·2	6·2	39·0	500
Arabs ...	32·4	19·0	5·0	43·6	500
Turks ...	38·0	18·6	6·6	36·8	500
Russians...	31·2	21·8	6·3	40·7	1000
Jews... ...	33·0	23·2	5·0	38·8	500
Malagasies	28·2	23·7	4·5	45·5	400
Negroes (Senegal)	22·6	29·2	5·0	43·2	500
Annamese	22·4	28·4	7·2	42·0	500
Indians ...	19·0	41·2	8·5	31·3	1000

TABLE III.

—	A B.		O.	
	Really found.	Calculation of probability.	Really found.	Calculation of probability.
	%	%	%	%
English ...	3·1	3·1	46·4	47·9
French ...	3·0	4·7	43·2	46·6
Italians ...	3·8	4·1	47·2	49·5
Germans...	5·0	5·1	40·0	43·1
Austrians	8·0	4·0	42·0	42·6
Serbs... ...	4·6	6·5	38·0	42·7
Greeks ...	4·0	6·7	38·2	43·4
Bulgarians	6·2	5·7	39·0	42·3
Arabs ...	5·0	6·1	43·6	47·5
Turks ...	6·6	7·0	36·8	39·9
Russians...	6·3	6·8	40·7	44·9
Jews... ...	5·0	7·6	38·8	44·5
Malagasies	4·5	6·2	45·5	49·5
Negroes (Senegal)	5·0	6·5	43·2	47·6
Annamese	7·2	6·4	42·0	45·3
Indians ...	8·5	7·8	31·3	43·7

Since A occurs in 43·4 per cent. and A B in 3·1 per cent., we have the property A altogether in 46·5 per cent., and correspondingly the non-A in 53·5 per cent. Similar calculations give for non-B 89·7 per cent. The calculation of probabilities thus gives for Group O: $\frac{53·5}{100} \times \frac{89·7}{100} = \frac{4798}{10,000} = 47·9$ per cent.

We actually found 46·4 per cent.

We made the same calculations for each people and race, and have shown the results in Table III. The table shows only slight differences between the calculation and the facts, the calculation giving somewhat higher results.

Basing our opinion on the whole of our material embracing about 8000 cases we look on Group O (the English Group IV.)

[4] In the English literature of the subject we find that the frequency of occurrence of B is higher and corresponds to the figures given by Landsteiner for Vienna. We cannot corroborate this. We examined our English material several times with seven different anti-B sera without finding a greater frequency than that here given.

[5] Loc. cit.

as the accidental conjunction of the two groups non-A and non-B, while Group I., our A B, is to be regarded as the accidental conjunction of the groups A and B. If, then, we wish to find exactly the frequency of A and B, we must add the English Group I. (our A B) to the Groups II. and III. Thus in the English subjects instead of 43·4 per cent. A, 7·2 per cent. B, and 3 per cent. A B, we read 46 4 per cent. A and 10·2 per cent. B.

In Table IV. the figures arrived at are shown diagrammatically, Group A being shaded and Group B black. The result is remarkable.

The prevalence of the Group A is characteristic of the European peoples. Most European peoples have not less than 45 per cent. A; in the Italians alone we found 41 per cent. This frequency of A only applies to Europe. In Africa and in Asia we find far fewer cases of A; the Russians and Jews 28 per cent. The Russians arranged according to districts show the following relationships:—

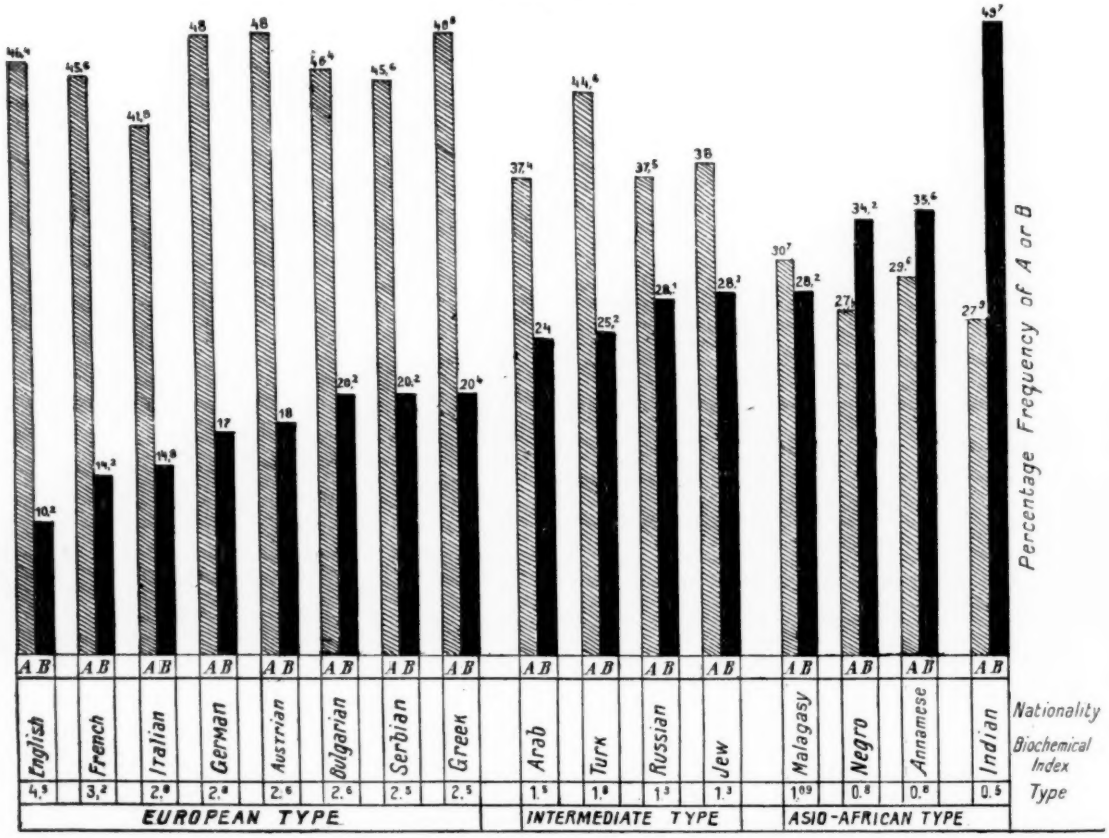
TABLE V.

—	A %	B %	Total.
Central Russia	37·6	25·2	400
Siberia	36·5	29·0	321
Ukraine	35·1	33·3	111
Perm, Vologda, &c.	36·8	34·5	84

Central Russia and Siberia show the intermediate type. Little Russia and the Volga District have the Asiatic type.

We see thus that A and B are present in different proportions in different races. The serological formula for a particular race is in no way affected by the anthropological

TABLE IV.—*Showing the Percentage Frequency of A and B Serological Reactions in Various National Types.*



Malagasies have 30 per cent., Negroes 27 per cent., Annamese 29 per cent., and Indians 27 per cent. of A. The countries lying between Asia and Central Europe, with the exception of the Macedonian Turks who have the European A frequency, show the intermediate type; the Arabs 37 per cent., the Russians 37 per cent., the Jews 38 per cent. Thus we see that going southwards and eastwards the frequency of A constantly diminishes. If we now consider Group B we find the exact opposite: the English who are farthest west have only 10 per cent., the French and Italians 14 per cent., the German Austrians 17 to 18 per cent. Of the Balkan peoples the Serbians and Greeks have the same frequency of 20·2 per cent. the Bulgars 20·4. The contrary is found in Africa and Asia. Group B, which is numerically low in Europe, reaches 28 per cent. in the Malagasies, in Negroes 34 per cent., in Annamese 35 per cent., and finally in Indians a maximum of 49 per cent. The peoples of the Mediterranean basin and the Russians in this also show the intermediate type: the Arabs have 24 per cent., Turks 25 per cent., characteristics. The Indians, who are looked on as anthropologically nearest to Europeans, show the greatest difference from them in the blood properties. The Russians and the Jews, who differ so much from each other in anatomical characteristics, mode of life, occupation, and temperament, have exactly the same proportion of A and B. On the other hand, it is clear that the distribution of A and B corresponds with surprising accuracy to geographical situation. The nearer to Western and Central Europe the more A and the less B, the nearer to Africa and Asia, especially to India, the less A and the more B. The peoples lying between Central and Western Europe on one side, and Africa and Asia on the other—that is to say, the peoples of the Mediterranean basin—show the intermediate type. In order to designate these relationships by a number we will call the proportion of A to B the biochemical race-index. We see that the race-index in the European peoples varies between 4·5 and 2·5, in the Asio-African peoples it is 1 or less, while the intermediate type is characterised by the race-index 1–2. (Table V.)

This remarkable fact, that A and B are represented in very different proportions in different races may be discussed from two standpoints. One can imagine that when man appeared on the earth A and B were present in the same proportions in different races. In this case the differences which are now present in different races would depend on the assumption that for unknown reasons A is more suitable for increased resistance of the organism to disease in a temperate climate, while B is more suitable in a hot climate. The hypothesis is improbable.

We see that the Russians in Siberia have the same proportion of B as the natives of Madagascar. The Jews who have lived for centuries in Monastir show a type of blood different from that of the other Balkan peoples. It is also a priori improbable that the climatic conditions should influence the frequency of A and B. If B could not be acclimatised in a temperate climate it should have died out in those climates long ago in the extended periods of time which we can take into consideration. It is very difficult to imagine one single place of origin for the human race in view of our statistics, since it would then be inexplicable why A diminishes from west to east and south, while B increases. The figures arrived at by us are most easily explained on the assumption that A and B had different points of origin and that there are two different biochemical races which arose in different places. In this case the mutual infiltration of these races is the cause of the varying proportion of A and B. Since the greatest frequency of B is found in India,[6] we should then look for the moment on India as the cradle of one part of humanity—namely, of the biochemical race B. Both to the east (Indo-China) and to the west, towards Europe and Africa, a broad stream of Indians poured out, ever lessening in its flow, which finally, although continually diminishing, penetrated to Western Europe. A similar single place of origin for A cannot be indicated, since all European peoples show a greater or less preponderance of A, which only seems to diminish somewhat in the Italians. Since, however, the Asiatic and African peoples are poor in A, we must assume hypothetically that A arose in North or Central Europe and spread out thence southwards and eastwards. A detailed examination of the northern races may lead us to unexpected and important conclusions on this point.

Conclusion.

We see then that the analysis of the figures we obtained has led us to remarkable results and that the highly interesting problem of a possible double origin of the human race has become a question which can be studied by means of serological methods. A problem of such dimensions may be propounded, but can hardly be resolved by the experimental results of a science, the introduction of which into these problems is here attempted for the first time. Still, we believe that we have shown in this paper that experiments in immunisation deserve to be made use of for the solving of anthropological questions. A close coöperation would be necessary between anthropologists and serologists, and the researches should be conducted on an international basis. The present war has brought so many races and peoples together that the main problems should certainly be capable of solution in a short time and without great labour. A series of important special researches, such as the examination of various stocks, primitive races, and anthropoid apes, should be begun without delay.

In our experiments we received much help from many medical and other officers of the Allied Armies in Macedonia. We owe our gratitude to the Directors of the Medical Services of the several armies for permission to examine soldiers and for other assistance. Major Stefanovitch and Captain W. L. Murphy, the liaison officers of the Serbian and British Army Medical Services, have undertaken the translation of the paper into English, for which we offer them our best thanks.

[6] Of the greatest importance are the researches from the Central Asia plateau.

THE War Office states that nurses whose names are mentioned in despatches for work in France, Egypt, or other places overseas will receive a certificate of the King's appreciation of their services.

TWO STUDIES OF MENINGOCOCCUS CARRIERS.

I.—THE SITE OF CARRYING IN CHRONIC MENINGOCOCCUS CARRIERS.

BY DENNIS EMBLETON, M.A., M.B. CANTAB.,
TEMPORARY MAJOR, R.A.M.C.; BACTERIOLOGIST, ROYAL VICTORIA HOSPITAL, NETLEY;
AND
W. SOHIER BRYANT, A.M., M.D. HARV., U.S.A., F.A.C.S.,
LATE CONSULTING RHINOLOGIST, MANHATTAN STATE HOSPITAL.

II.—A STUDY OF 905 MENINGOCOCCUS CARRIERS.

BY DENNIS EMBLETON,
AND
GEORGE H. STEVEN, M.B., CH.B. EDIN.,
TEMPORARY CAPTAIN, R.A.M.C.; BACTERIOLOGIST, ROYAL VICTORIA HOSPITAL, NETLEY.

(*Reports to Medical Research Committee.*)

I.

THE "site of carrying" of the meningococcus has been investigated in 40 chronic carriers, 21 of these had already suffered from cerebro-spinal fever, 19 had never suffered from the disease, but had been found to be carriers on examination of the naso-pharynx. With only five exceptions these chronic carriers had been subjected to treatment with a Levick spray, charged with either chloramine or zinc sulphate daily for two months or more prior to this investigation. All the carriers were known to have carried for at least four weeks, the most chronic had been carrying for 15 months.

The naso-pharynx was illuminated by means of a forehead mirror and direct sunlight, material for culture being taken with a small-looped platinum wire from the various sites chosen. The patients were not exposed to any form of antiseptic treatment for 24 hours prior to examination. The sites chosen were:—

Through the nose.—Anterior ends of the lower turbinates, anterior ends of the middle turbinates, posterior ends of the lower turbinates, anterior wall of the sphenoid, fossæ of Rosenmüller upper, Luschka's tonsil.

Through the mouth.—Faucial tonsil crypts, fossæ of Rosenmüller lower, back wall of the naso-pharynx.

These sites were also strategical, as any discharge from the accessory sinuses of the nose would appear at one of these points. Thus discharge from the sphenoid sinus would appear on the front wall of the sphenoid; the discharge from the anterior ethmoidal, frontal, and maxillary sinuses over the anterior third of the lower turbinate; and the discharge from the posterior ethmoidal cells over the posterior third of the lower turbinate.

The utmost steadiness and care was required to obtain an uncontaminated loop through the obstructed nasal fossæ from the deep structures. Only such loops as were thought to be uncontaminated were used for culture. The following method of obtaining cultures from these sites was devised in order that the various parts examined might not be contaminated by infected material before they were themselves cultured.

The anterior end of the lower turbinate was cultured first, as it was accessible in every case. The anterior end of the middle turbinate was often hidden. Eucaine and adrenalin had to be applied in these cases to the anterior end of the lower turbinate before the middle turbinate could be seen and reached without contaminating the platinum loop. The posterior end of the lower turbinate was cultured after it was brought plainly into view by shrinking the anterior portion. Then the anterior wall of the sphenoid was exposed by shrinking the middle turbinate.

Up to this point a straight wire was employed, but for the investigation of the fossæ of Rosenmüller a platinum wire was bent slightly on the flat of the loop. The nasal orifices were held apart by a speculum, the wire was passed along the floor of the nose steadied against the speculum, with the loop well up from the floor. After the loop had passed by the posterior end of the lower turbinate and the Eustachian ring the wire was rotated, bringing the loop pointing towards the fossæ of Rosenmüller. The loop was

then pushed deep into the fossa, the extraction of the loop was accomplished by reversing the process of insertion. The next cultural site, Luschka's tonsil, was reached with a straight wire, the loop being inserted deep into the pharyngeal tissue.

The faucial tonsils were cultured through the mouth, a platinum wire with a small loop 2·5 mm. in diameter and bent at right angles was used, which could be readily carried to the bottom of one or more crypts. The deepest and most difficult to culture of all the sites were the lower portions of the fossæ of Rosenmüller. The reason for this difficulty was that the velum palati was apt to contract against the platinum loop, making it touch the medium region of the back wall of the naso-pharynx below Luschka's tonsil. In order to obtain accurate cultural material from these positions great patience had to be observed. The wire was bent in a curve to allow it to pass readily over the tongue and by the edge of the velum palati. The curved wire was passed flat over the tongue until it had passed beyond the edge of the velum, the end of the wire was then turned upwards pointing towards the fossa of Rosenmüller and inserted. A posterior rhinoscopic mirror was not used in these patients because of the labour required in educating them to coöperate in this method of examination. Instead, the moment when the velum was relaxed the wire was quickly passed into the fossa and out again.

The last culture was taken with the curved wire from the back wall of the naso-pharynx below Luschka's tonsil.

As many of these sites as was possible were examined at one sitting of the patient. The greatest attention was paid to regions found to be more usually infected by the meningococcus, whereas the regions which were proved to be least infected were not cultured so often.

The material as soon as it was obtained was planted on to a trypsinised ox-heart legumin hæmoglobin agar plate, made according to the formula of the Central C.-S.F. Laboratory (Lieutenant-Colonel M. H. Gordon), fresh and not frozen ox-hearts being used. The medium was kept warm (as near as possible 37° C.) until inoculated with the material from the platinum loop, was then rapidly rubbed over the surface with a glass spreader, and returned to the incubator while still warm The plates were examined within 24 hours, two likely colonies from each plate being subcultured. These two subcultures were examined after 24 hours' growth, and if shown to be Gram-negative cocci were subjected to agglutination tests, against the standard sera supplied by the Central C.-S.F. Laboratory, Lieutenant-Colonel Gordon's technique being followed. No specimen was admitted to contain meningococci unless one at least of these colonies agglutinated with a specific serum and not with a normal.

The extreme degree of specificity of the standard serum and the constancy of its properties has been noteworthy throughout the whole time that it has been issued.

TABLE I.

(A) Number of examinations. (B) Number showing meningococcus. (C) Percentage showing meningococcus. (D) Percentage of positive cultures giving nearly pure culture of meningococcus.

—	Convalescent cases.				Contact carriers.				Totals.		
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)	(A)	(B)	(C)
Ant. end lower turbinate. R.	14	0	—	—	12	0	—	—	48	0	—
Ant. end lower turbinate. L.	11	0	—	—	11	0	—	—			
Ant. end middle turbinate. R.	11	0	—	—	6	0	—	—	32	0	—
Ant. end middle turbinate. L.	8	0	—	—	7	0	—	—			
Post. end lower turbinate. R.	9	0	—	—	7	1	14	—	29	2	7
Post. end lower turbinate. L.	7	0	—	—	6	1	17	—			
Ant. wall of sphenoid. R.	15	0	—	—	7	0	—	—	34	0	—
Ant. wall of sphenoid. L.	10	0	—	—	2	0	—	—			
Luschka's tonsil. R	77	22	29	36	69	27	39	63	288	97	34
Luschka's tonsil. L.	76	22	29	36	66	26	40	52			
Fossæ of Rosenmüller, above. R	10	1	10	0	14	7	50	14	49	19	39
Fossæ of Rosenmüller, above. L.	14	5	36	25	11	6	55	17			
Faucial tonsil crypts. R	81	8	10	0	77	13	17	0	320	38	12
Faucial tonsil crypts. L.	79	8	10	0	83	9	11	22			
Fossæ of Rosenmüller, below. R.	55	22	40	27	42	28	67	64	191	99	52
Fossæ of Rosenmüller, below. L.	56	29	52	31	38	20	53	60			
Back wall of naso-pharynx.	81	32	40	37	73	44	60	48	154	76	49

R., Right; L., Left.

From Table I. it is at once apparent that in the chronic carrier the upper and anterior portion of the nose is free from infection with the meningococcus. 143 examinations of this portion—i.e., the lower and middle turbinates and the anterior wall of the sphenoid—gave only two positive cultures. These two cultures were obtained from the same carrier on the same day. The infection was exceedingly light as only three colonies were found on the right posterior end of the lower turbinate and four colonies on the left. It is probable that this infection of the turbinates was accidental and may have been produced by sneezing.

The posterior and lower portion of the naso-pharynx was richly infected with the meningococcus. 682 examinations of this region—i.e., Luschka's tonsil, the fossæ of Rosenmüller, and the back wall of the naso-pharynx—gave 291 positive readings, or 43 per cent. This position is the part swabbed in examining a carrier. 43 per cent. is, however, a very low reading to obtain from a series of chronic carriers, even though it is known that chronic carriers are apt to be intermittent. This matter has already been dealt with in another paper; as, however, an explanation seems to be required for this low reading the following figures are quoted.

388 swabs were taken from the posterior naso-pharynx on an identical series of cases over the same period of time, 239 were made with a stiff brass wire (gauge 18), giving 163 positives, 68 per cent.; and 149 with an ordinary platinum loop, giving 71 positives, 48 per cent.

The increased number of positives, 20 per cent., brought out by the use of the stiff wire was thought to be due to the meningococci not being only on the surface but being squeezed out of the crypts by the greater pressure able to be exerted by the stiffer wire.

The faucial tonsillar crypts were also found to be infected. 336 separate examinations gave 41 positive readings, or 12 per cent. This had been unexpected, though the tissue examined is of the same character as Luschka's tonsil. The importance of this observation is that the tonsils are not examined as a routine measure in chronic carriers, whereas this shows that they are an important carrying site. See also Table III.

TABLE II.

—	No. examined.	Tonsils proved positive in—	Tonsils positive.
Convalescent cases known to be carriers	21	9	43%
Contacts known to be carriers	19	12	63%
Total	40	21	52·5%

Thus, Table II. shows that although the percentage of examinations in which the tonsils were found to be infected was low, 12 per cent., more than half of the carriers investigated were found to be tonsillar carriers.

It is not desired to lay too much stress upon the actual sites investigated or to labour the points that Luschka's tonsil showed 33 per cent. of positive examinations, whereas the back wall of the pharynx, a position at most an inch away, showed 49 per cent. It would be quite impossible to differentiate accurately between the fossæ of Rosenmüller above and below, Luschka's tonsil, and the back wall of the naso-pharynx. In this region various factors have to be considered as liable to infect one site from another.

1. *Cilia*.—The ciliated epithelium extends downwards as far as the level of the Eustachian tubes. The action of these cilia is to propel superficial bodies from the direction of the nasal orifices posteriorly and downwards towards the back wall of the naso-pharynx. The cilia will thus heap up the debris removed from the upper part of the nose on the stratified epithelium which joins on to the ciliated epithelium at the level of the Eustachian tubes.

2. *Coughing and sneezing*.—The former clears the posterior pharyngeal wall and might also force infected material in an upward direction. Sneezing would be apt to project infected material upwards, and thus sites not usually found infected might be found temporarily so, until the cilia had cleared up the infected debris.

3. Moisture trickling down from higher positions would also tend to infect lower positions. The direction of infection in this case would correspond with the currents produced by the cilia.

Thus in the chronic carrier the parts infected with the meningococcus are: Luschka's tonsil, the fossæ of Rosenmüller, the posterior wall of the naso-pharynx, and the cial tonsils.

The accessory nasal sinuses were not found to be infected in any of these cases. They were not investigated directly, so it is possible that their ostia may have been occluded so that the discharge did not appear at our strategical points. Against this view it can be urged that the examinations were carried on for two months, so the occlusion, if present, cannot have been of a temporary nature, and, also, none of these cases ever showed any symptoms of sinus trouble subsequently, although observed for many months. There were also among these carriers no cases which subsequently suffered from relapses. The relationship between infection of the sphenoidal sinus and relapsing cases will be discussed in another paper.

TABLE III.

Convalescent cases.	Age.	Duration of carrying before this investigation.	Total period remained a carrier.	Type of meningococcus.	Bacterial distribution. Luschka's tonsil.	Rosenmüller above.	Rosenmüller below.	Back wall of naso-pharynx.	Faucial tonsils.	Anatomical condition. Degree of nasal obstruction.	Pharyngeal lymphoid hypertrophy.	Faucial tonsils hypertrophy.	Definite "adenoids" present.	Caries of teeth.	Nasal discharge.
		Months.													
Be.	21	1	10	I.	0	0	+	+	0	2nd.	Sll.	0	0	+	+
Bi.	25	5	6	I.	+	+	+	+	0	1st.	Yes.	+	+	0	0
Bo.	22	5	13	II	+	0	+	0	+	2nd.	Sll.	0	0	0	0
Dy.	26	2	11	I.	0	−	+	+	0	2nd.	Yes.	0	0	0	0
El.	22	4	7	I.	+	+	+	+	0	1st.	Yes.	+	+	0	0
Fr.	20	3	16	II.	+	0	0	+	0	3rd	Yes.	0	0	+	0
Gi.	20	2	6	I.	+	−	+	+	+	3rd.	Yes.	+	+	+	0
Ha.	19	2	10	I.	0	+	+	+	+	3rd.	Yes.	+	+	0	+
Ho.	37	5	12	II.	+	0	+	+	+	2nd.	Yes.	+	+	0	0
In.	27	3	16	I.	+	−	+	+	0	1st.	Yes.	0	0	+	0
Ja.	20	4	8	II.	0	−	+	0	+	1st.	Yes.	0	0	+	0
Jo.	25	5	10	I.	0	−	−	+	0	1st.	Yes	++	++	0	0
La.	20	3	4	I.	+	−	+	+	0	2nd	Yes	+	+	0	0
Ma.	36	1	3	I	0	0	+	0	0	1st.	Sll.	0	0	P	+
Mi.	24	6	13	I.	+	0	+	0	0	3rd.	Yes.	0	0	+	0
Ni.	40	6	12	IV.	+	+	+	+	+	3rd.	Yes.	0	0	0	0
Sc.	22	4	6	I	+	−	+	0	0	1st.	Yes.	+	+	0	0
Sh.	18	2	4	I	+	−	+	+	+	3rd.	Sll.	+	+	0	0
Sm.	27	15	?25	I.	0	0	0	+	0	1st.	Yes.	+	+	+	+
Ta.	19	7	13	I.	+	−	+	+	+	3rd.	Yes.	+	+	+	0
We.	24	3	4	II.	+	0	0	+	+	2nd.	Yes.	0	+	0	0
Contact Carriers.															
An.	33	5	9	II.	+	−	+	+	+	3rd.	Yes.	+	+	0	0
Don.	34	5	8	II.	+	−	+	+	+	2nd.	Yes.	0	0	+	0
Dor.	40	3	14	II.	+	+	+	+	+	2nd	No.	0	0	+	0
Du.	22	9	21	II.	+	0	+	+	0	3rd.	Yes.	+	+	0	0
Har.	37	5	16	II.	+	+	+	+	+	2nd.	Yes.	0	0	+	0
Hay.	37	2	14	III.	+	+	+	+	0	2nd.	Yes.	0	0	0	0
Hi.	41	5	14	II.	+	0	+	+	0	2nd.	Yes.	+	+	0	0
LaM.	20	3	4	IV.	0	0	+	0	0	2nd.	Yes	0	0	+	0
McO.	19	5	18	II.	+	+	+	+	+	2nd.	Yes.	+	+	+	0
McF.	39	5	16	II.	+	0	−	+	+	1st.	Mar.	0	0	0	0
Ne.	27	3	15	I.	+	0	+	+	0	3rd.	Yes.	0	0	+	0
Nr.	28	4	8	II.	+	−	+	+	+	2nd.	Yes.	0	0	+	0
Pa.	57	3	5	II.	+	+	0	+	0	Sll.	Yes.	0	0	+	0
Ph.	21	2	8	II.	+	−	+	+	+	3rd.	Yes.	+	+	+	0
Pl.	39	5	7	II.	+	+	+	+	+	2nd.	Yes.	0	0	0	0
Th.	31	4	10	I.	+	−	+	+	+	3rd.	Yes.	0	0	0	0
Web.	28	5	11	II.	+	0	+	+	+	3rd.	Yes.	0	0	0	0
Wed.	31	5	8	II.	+	−	+	+	+	2nd.	Yes.	0	0	0	0
Ye.	18	4	5	IV.	0	−	+	+	0	2nd.	Yes.	+	+	0	0

+, Meningococcus proved to be present by agglutination tests or condition under examination present. 0, Meningococcus or condition under examination not found. −, Examination not made. P, Marked pyorrhœa alveolaris. Sll., slight. Mar., marked.

Nasal obstruction 1st degree is taken to mean that the surfaces of the nose which are normally free are in contact at one or more points. ¼ obstructed. *2nd degree:* One or two of the nasal fossæ, upper or middle, are closed ¼ to ½ of whole obstructed. *3rd degree:* Three nasal fossæ on one side and the other side partially stopped; mouth breathing ¾ of whole obstructed.

In Table III. an attempt is made to set forth the infected sites in these carriers and the observed anatomical or pathological conditions of the naso-pharynges. In addition, the ages and the length of time which these cases had been known to carry up to the time of this investigation, and the total length of time ultimately carried by them, is tabulated.

In every case there was some degree of nasal obstruction. Of the 40 cases examined, 13 showed 3rd degree obstruction, 17 showed 2nd degree, 9 showed 1st degree, and 1 slight obstruction only. It was noticeable that the obstruction in the convalescent cases was less than in the contact carriers. There was no marked relationship between the nasal obstruction, the length of time the patient remained a carrier, and the heaviness of the meningococcus infection.

The average times these cases showing the various degrees of nasal obstruction remained carriers are as follows: Nasal obstruction 3rd degree, 11 months; 2nd degree, 10 months; 1st degree, 9 months.

In estimating the average carrying time for the 1st degree obstruction patients (Sm.) is not included, as there was an element of uncertainty in his earlier history as a carrier. He was treated in another hospital for his acute illness, and was discharged suffering from cephalalgia and other symptoms suggestive of internal hydrocephalus. On admission to this hospital he was examined and found to be a carrier; his carrying period in Table III. is estimated from the onset of the acute attack, as all other cases examined here showing these symptoms have been shown to be carriers, although intermittent.

All carriers examined showed pharyngeal lymphoid hypertrophy with one exception. It is possible that this condition may favour the carrier state, but the almost universal presence of this state among the troops in a greater or lesser degree shows that it cannot be the only factor causing the "chronic carrier."

The enlarged tonsils and definite adenoids, again, cannot be looked upon as the cause of the "chronic carrier," as these were observed in less than 50 per cent. of these men only. A definite nasal discharge was only occasionally observed. The infection of an accessory nasal sinus does not appear necessary for the production of a "chronic carrier." In this we differ from Captain F. J. Cleminson,[1] who considers that his observations "point in the direction of the accessory sinus as being the main seat of meningococcus infection in carriers." No relationship could be established between the position infected and the length of time the "carrier condition" persisted. The average age of the contact carriers investigated was greater than that of the convalescent cases, but from so small a number of men it would be unsafe to draw conclusions.

The exact reason why a person infected with the meningococcus becomes a chronic carrier is not clear, it is probable that nasal obstruction and pharyngeal lymphoid hypertrophy favour this condition. The presence or absence of definitely enlarged tonsils and adenoids does not seem important. If the nasal obstruction, &c., is to be regarded as essential, it is extraordinary that the cases ultimately became free from infection without any surgical interference.

All carriers have been most rigorously subjected to nasal disinfection in the Netley Carrier Centre; the full details of the treatment have been recently published.[2] No method of treatment has apparently in any way influenced the carrying period of the chronic carriers. The effect of the treatment was to reduce the superficial organisms, both in number and variety, so that the naso-pharyngeal cultures became in nearly all cases practically pure cultures of the meningococcus. It has also been suggested that the organisms more particularly existed in the deeper retro-pharyngeal tissue and not only on the surface. This has been referred to earlier in this paper, where a 20 per cent. increase in positive readings was obtained in the results of the naso-pharyngeal swabs when performed with a stiff brass wire, over the results obtained with a more flexible platinum loop. This increase was attributed to the pressure able to be exerted with the brass wire, so squeezing meningococci out of the deeper tissues.

The factor which was by far the most powerful in eliminating the meningococcus in the chronic carrier was the incidence of "a cold in the head." The plate which previously had shown a nearly pure culture of the meningococcus became deeply infected with some other bacterium and most frequently the meningococcus disappeared for good. The chronic meningococcus carrier, however, seemed to be relatively immune to "colds"; it was only occasionally that an infectious cold spread to more than one or two individuals. The outbreak of influenza in July, 1918, attacked nearly every carrier in the camp (more than 100 men); there were no severe cases, and in July and August a very large proportion of the carriers became free from infection.

The other method by which a chronic carrier became free from infection was by the invasion of the "site of carrying" by some other bacterium; this was very easily observed in many cases where a readily recognisable pigment-producing

organism was the agent. This question is dealt with more fully in the ensuing article.

It would thus appear that the meningococcus disappears from the naso-pharynx when an invasion by some other bacterium is successful. This suggests the fact that these chronic carriers must always exist as carriers of some bacterium, and if that bacterium is non-pathogenic so much the better.

If once the "site of carrying" is infected by the meningococcus, the meningococcus will remain entrenched in this position until ousted by some other bacterium. The length of time taken for the eviction of the meningococcus will correspond with the length of time the case remains a carrier. What exact factors are requisite for the eviction of one organism by another are not at present known. But it is possible that the factor which influences the production of the chronic carrier and the factor which promotes the eviction of one organism by another are closely related.

The exact site of carrying would appear to be either in the muciferous glands or in the crypts of Luschka's or the faucial tonsil. The technique adopted in this paper is insufficiently specific to determine this point.

The authors beg to acknowledge their extreme indebtedness to Miss I. Harmer and Miss D. Gardiner for their able assistance in carrying out the technical details in connexion with this research.

Conclusions.

1. The sites of carrying in the chronic meningococcus carrier are Luschka's tonsil, the fossæ of Rosenmüller, the retro-naso-pharyngeal wall, and the faucial tonsils.

2. The anterior and upper parts of the nose and the nasal sinuses are not as a rule infected.

3. The presence of lymphoid hypertrophy and nasal obstruction, although it may favour the production of a "chronic carrier," is not necessarily the cause.

References.—1. Cleminson: Brit. Med. Jour., July 20th, 1918 2. Embleton and Steven: "The Persistence of Cerebro-spinal Fever Cases as Carriers of the Meningococcus during Convalescence," THE LANCET, May 10th, 1919.

II.—MENINGOCOCCUS CARRIERS.

BY DENNIS EMBLETON AND GEORGE H. STEVEN.

There were 905 carriers investigated at the Netley Cerebro-spinal Fever Centre between Sept. 29th, 1916, and April 26th, 1919. The earlier period from 1914 to September, 1916, is not included in this paper, for although the work was performed by the same bacteriologist, the meningococci found in the naso-pharynges of the carriers were not proved by serological tests, cultural and sugar reactions only being relied upon. In this paper no organism has been accepted as a meningococcus unless it agglutinated with the standard sera supplied by the Central C.-S.F. Laboratory (Lieutenant-Colonel Gordon) and not with normal serum.

The subject of carrying in cases and contacts of cerebro-spinal fever is discussed in this paper under the following heads: 1. Acute and Chronic Carriers. 2. Treatment of Carriers. 3. Mechanism of Elimination of the Meningococcus. 4. Non-agglutinable (?) Meningococcus Colonies. 5. Bacterial Replacement of the Meningococcus.

1. *Acute and Chronic Carriers.*

The technique adopted for the examination of the carriers was as follows:—

A weekly examination of the carriers was made except in those cases actually under a prolonged course of treatment. Cases under naso-pharyngeal treatment were not examined within 24 hours of the last application of antiseptic. Swabbing was performed with a stiff brass wire (gauge 18), which was wrapped with a thin pledglet of cotton-wool for its last inch. This last inch was bent nearly at a right angle with the rest of the wire. The tongue was depressed with the handle of a table-spoon, and the bent end of the wire carried as far up behind the soft palate as possible. Firm pressure was applied to the posterior naso-pharyngeal wall with the wire, which was finally withdrawn, great care being always observed to avoid touching the tongue, mouth, &c.

The swabs very rarely showed any blood-stain, but if a second swab were taken immediately after the first it was always found stained with blood. The pressure exerted did not cause appreciable discomfort, the wire being always preferred to the "West swab" by the patient. Petri dishes containing trypsinised ox-heart legumin hæmoglobin agar (prepared according to Lieutenant-Colonel Gordon's formula) were brought warm to the swabbing room; they were lightly inoculated on the surface with the swab, spread at once with a glass spreader, and transferred as soon as possible, while still warm, to the incubator. Twenty-four hours later two likely colonies were picked off and subcultured. These subcultures, if found to be Gram-negative cocci, were both then subjected to agglutination with the standard sera. If either or both cultures gave a positive agglutination the case was regarded as still a carrier. No carrier was discharged until he had two consecutive negative examinations at a week's interval.

In the case of carriers of over three months' duration, owing to the discovered intermittency of carrying, three consecutive negative weekly examinations were required before discharge. In this paper a carrier has been considered to cease carrying from the day on which the first of the terminal negative examinations is discovered.

Of the 905 carriers examined, 86 were carriers after an attack of cerebro-spinal fever (case carriers). 819 had never suffered from the disease, but had been found to be carriers after an examination of the naso-pharynx (healthy carriers). The types of the meningococcus and the length of time that these patients remained carriers are set forth in Table IA. The first or upper part of this table is devoted to "healthy carriers," the second or lower half to "case carriers." Opposite to the Roman figures, denoting the type of meningococcus recovered from the naso-pharynges, are given the number of carriers who became free from infection

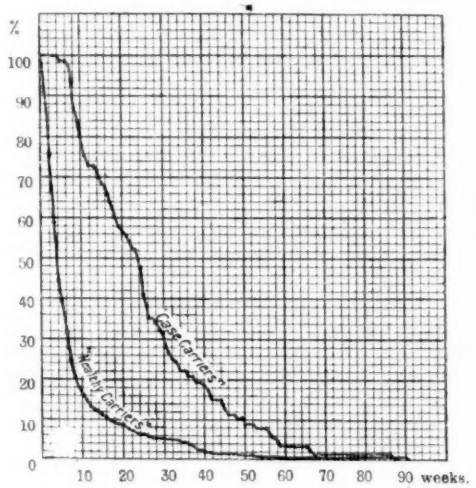
TABLE IA.

| | Weeks. | | | | | | | | | | | | | | | | Lunar months. | | | | | | | | | | | | | | | |

during the period noted at the head of the column. Opposite to the "Total remaining" heading are given the numbers of carriers still remaining infectious at the commencement of the period denoted at the head of the column. Opposite to the "Total discharge" heading are given the numbers of carriers who became free from infection during the period noted at the head of the column.

In order to demonstrate the rate of discharge of the carriers graphically, a chart has been prepared (Table IIA.). In this graph the number of carriers remaining infectious at the end of each week has been expressed as a percentage. The "healthy carriers" and "case carriers" are charted separately. The regularity of the "healthy carrier" curve is particularly noteworthy.

TABLE IIA.



On examining Table IA. it is at once apparent that the discharge rate for "healthy carriers" rises to its maximum in the third week, and drops away week by week until at the end of the eighth week it reaches a steady level. This period of maximum discharge is due to the clearing of the acute or temporary carriers. It would thus appear that the dividing line between the acute and the chronic carrier should fall at the end of the eighth week.

"Healthy carriers." Per cent.	Discharged by end of—
9·3	1st week.
24·1	2nd ,,
41·3	3rd ,,
56·6	4th ,,
68·6	6th ,,
79·9	8th ,,

Thus from a batch of 819 "healthy carriers" 79·9 per cent. were discharged at the end of eight weeks, 20·1 per cent. remaining carriers, so that the proportion of acute or temporary carriers to chronic carriers is as 4:1. The average length of time that the acute carriers remained infectious was 24 days, the maximum rate of discharge occurred during the third week. The "rate of discharge" appears to be approximately the same for all types of meningococci.

The average time for which the chronic carriers carried—i.e., those of over eight weeks' duration—was 159 days, or 5½ months. The longest time a carrier remained infectious was 634 days, or 1 year and 9 months; this man carried a Type 2 meningococcus. The average length of time during which the "case carriers" remained infectious was 173 days, which is slightly longer than the average carrying time of the "chronic healthy carriers."

In a previous communication [3] we have drawn attention to the fact that it is extremely rare for a "case carrier" to change the type of coccus found in the naso-pharynx. Only 1 case out of 104 was ever demonstrated to have changed type; this change was from a Type 1 to a Type 2 coccus. Of 819 healthy carriers investigated we have never found an example of change of type, in spite of close association between carriers of all the four strains of meningococci. This fact we look upon as of considerable importance, as it undoubtedly points to the fact that some degree of immunity is established in the carrier, which is specific to type. In making this statement we do not mean to imply that we have never isolated, for example, a Type 3 coccus from the naso-pharynx of a Type 2 carrier, but that if this did occur a further swab would show that this was accidental or temporary, and that the Type 2 coccus was the real infection. These anomalies were possibly due to some accident, either in marking the colony or plate, or to overlapping of one half of the Petri dish by another specimen, where two swabs had been cultured on one plate. Sometimes it appeared that a change from Type 1 to Type 3, or Type 2 to Type 4 had occurred, a colony giving a greater agglutination to one or other type than usual. It was, however, found that if a saturation test were performed the original type was shown to be still present. This was found fairly frequently, and is easily understood, as the relationship between a Type 1 and Type 3 coccus is close, as is also the relationship between a Type 2 and Type 4. More rarely a carrier was found to have apparently changed from, say, a Type 2 to a Type 1. As an example of this the following Type 2 carrier can be quoted. This man's coccus agglutinated for several weeks purely to Type 2 serum, then for several weeks a slight agglutination was also recorded for Type 1 as well as Type 2. He then gave colonies which agglutinated only to Type 1 serum. It appeared that a change of type had occurred. The coccus that agglutinated to Type 1 serum was tested by the saturation test, and was shown to be a Type 2. Thus, the apparent change of type was due to an anomalous agglutination and was not real.

2. *Treatment of Carriers.*

In a previous paper [3] we have detailed in full the methods adopted for the treatment of meningococcus carriers at Netley. It is not necessary here, therefore, to give more than a summary of these methods. Within 24 hours of a case of C.-S.F. being proved all the immediate contacts were swabbed; they were then placed under treatment. In the majority of cases the early treatment consisted in parades held twice a day, when 1-5000 potassium permanganate dissolved in 0·9 per cent. normal saline was sniffed up the nostrils. This treatment was continued until the arrival of a Levick spray apparatus at the camp, or until the men found to be carriers were removed to the Netley Carrier Centre. The proved carriers were then vigorously treated twice daily by one of the following methods:—

Inhalation chamber—Chloramine-T, zinc sulphate.

Hand spray—Flavine and adrenalin, chloramine in paraffin, lecithin in paraffin, electrosal.

Direct application—Ferri perchlor., mercuric ointment.

Each of the above methods can claim a certain number of "cures," inasmuch as it was the last used before the case eventually ceased to "carry"; on the other hand, each method has been used in many cases for prolonged periods without eliminating the meningococcus. No method of treatment employed appeared greatly to influence the rate of disappearance of the meningococcus from the naso-pharynx. An example of the effect of the Levick spray on a series of carriers who had already carried for six weeks may be quoted. (Table IIIA.)

TABLE IIIA.

Treatment.	Dates. From—	Dates. To—	No. treated. Carried over.	No. treated. New.	No. treated. Total.	No. discharged.
Chloramine	7/4/17	26/4/17	—	—	23	5
Zinc sulphate	27/4/17	3/5/17	18	5	23	2
Chloramine	4/5/17	16/5/17	21	6	27	0
Zinc sulphate	17/5/17	23/5/17	27	0	27	0
Chloramine	24/5/17	23/6/17	27	1	28	0
Zinc sulphate	24/6/17	18/7/17	28	0	28	2

Seventeen of the carriers shown in Table IIIA. were treated with either chloramine or zinc sulphate from 7/4/17 to 18/7/17, a period of 102 days, and were still carriers at the end of this time. Cultures taken from carriers within half an hour of exposure to the Levick spray, when either charged with

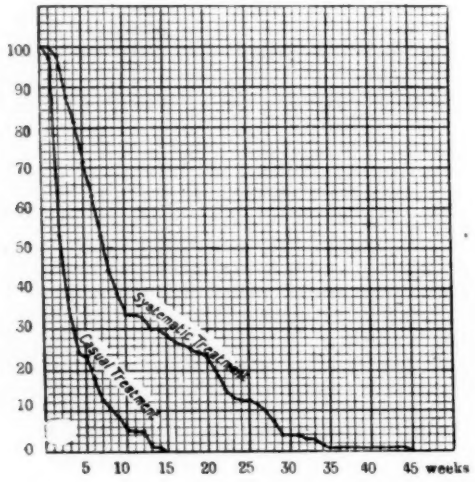
chloramine or zinc sulphate, frequently showed a pure culture of the meningococcus.

These observations led to the idea that not only were the Levick spray and other intensive methods of treatment of little avail, but that it was possible that they even prolonged the carrying period. It was decided that comparative observations should be made on a large series of carriers, to determine whether casual or systematic treatment produced the most rapid clearance of carriers.

All carriers occurring between 3/12/17 and 3/12/18 were divided into three groups: (1) Those receiving systematic treatment from the beginning—i.e., Levick spray twice daily or the hand spray charged with flavine, &c.; (2) those receiving casual treatment—i.e., at most an occasional douching with 1-5000 potassium permanganate; (3) those receiving a combination of 1 and 2. Group 3 were small in number, and no particular conclusions can be drawn from them. They are therefore not further referred to. Group 1, systematic treatment, includes 130 carriers; Group 2, casual treatment, includes 106 carriers.

In Table IVA. the number of men remaining infectious is expressed graphically as a percentage. At the end of four

TABLE IVA.



weeks 75·4 per cent. of the "casuals" were discharged, as opposed to only 18·4 per cent. of the "systematically treated." At the end of eight weeks 89·6 per cent. of the "casuals" and 55·4 per cent. of the "systematics" were free from infection. In 15 weeks all the casually treated carriers were free from infection, whereas it took 45 weeks to clear the systematically treated ones. It is noteworthy in addition that the man who conducted the systematic disinfection was the most prolonged of all the carriers, carrying altogether for 634 days. It would thus appear that vigorous treatment of the naso-pharynges of carriers prevents rather than aids the elimination of the meningococcus. Tulloch[4] also has suggested that strong antiseptics may be harmful and retard the clearing of carriers.

3. *Mechanism of Elimination of the Meningococcus.*

From the above discussion it would appear that, if careful and accurate examinations of the naso-pharynges are made, none of the methods of naso-pharyngeal disinfection tried have any appreciable deleterious effect on the meningococcus when once this has invaded the deeper tissue. To what process can one then attribute the disappearance of the meningococcus from the carrier?

In a previous paper[5] it has been shown that the "carrying site" in chronic carriers is extremely restricted in area. The upper and anterior parts of the nose are not infected, but the infection is limited to: Luschka's pharyngeal tonsil, the fossæ of Rosenmüller, the back wall of the naso-pharynx, and the faucial tonsils.

There is no doubt that the superficial areas can be dealt with and sterilised, but it appears impossible for the disinfectant to penetrate the deeper structures—i.e., the crypts of the adenoid tissue, or the mucuerous glands—and this is quite easily understandable. The mechanism by which the meningococcus is ousted is obscure; it does not appear to us to be in any way connected with the antiseptic, but appears to be ousted by some other bacterium.

It was noticed that if a chronic carrier developed a "cold in the head" he very frequently became free from infection with the meningococcus. The area invaded in a common cold is the same area as that inhabited by the meningococcus in a carrier. It was not at all common for carriers to develop "influenza colds," and if one man developed a cold it very rarely spread to others. It was not clear whether this was due to the fact that the carriers were under continuous nasal disinfection, or that they were living an open-air camp life, or that it was due to the fact that the site of infection in the "common cold" was already occupied by another organism (the meningococcus), and this prevented the invasion of the "cold" organism. In the "Spanish influenza" epidemic of June and July, 1918, there were 105 carriers in the camp; of these practically every man was down at one time or another. The symptoms were very typical, and were limited to headache, sore-throat, and fever, the whole disease being over in three days. The epidemic was not characterised by profuse nasal discharge, and the symptoms were not those usually associated with a common cold. The effect on the carriers was not so pronounced as usual in the way of clearing, but in spite of this the discharge rate—i.e., the percentage discharged to the total under examination—rose from May 20 per cent., June 18 per cent., to July 51 per cent., August 50 per cent.

In examining the plates from a series of contacts before any treatment has commenced it can be observed that the naso-pharyngeal plates show innumerable colonies of many different organisms. As soon as treatment of the naso-pharynx is commenced the total number of colonies appearing is markedly reduced. If a swab be taken within an hour of treatment few, if any, colonies can be obtained unless sufficient pressure is exerted to squeeze bacteria from the deeper parts of the tissues. While a naso-pharynx is under systematic treatment it is rare to find many different types of organisms present at the same time. Frequently only one type of colony appears, and if there are other organisms present they only appear as a few isolated colonies. This observation leads to the conclusion that whatever organisms may be present superficially, only one organism as a rule at a time inhabits the deeper tissues. Thus, in a meningococcus carrier under treatment the plates week after week show little else than meningococcus colonies until they cease to appear.

It was noticed that a pigment-producing organism was frequently associated with the disappearance of the meningococcus. It was subsequently noticed that in almost all cases when once this organism had appeared the meningococcus ceased to appear. The disappearance of the meningococcus did not appear due to inability to grow in the presence of this organism, for frequently half the colonies on a plate were typical well-grown meningococcus colonies, which on subculture would agglutinate well. As we have stated above, the plates from a chronic meningococcus carrier under treatment usually show few organisms in addition to the meningococcus, many being to all intents and purposes pure cultures. On the appearance of the pigment-producing organism the usual numbers of colonies appear the same, but the plate is shared between the meningococcus and this organism, usually well in favour of the pigment producer; other colonies do not become more numerous. The following week all or nearly all the colonies may belong to the pigment producer, no meningococcus and few, if any, other colonies appearing. The patient thus appears to have a practically pure infection with the pigment producer. No investigation has been made to determine if the carriers ever become chronic carriers of this organism, but in the majority of cases this organism either disappears, or becomes submerged in other organisms, as soon as naso-pharyngeal treatment ceases, when a very great increase in the number of colonies and their variety has always been noted to occur. This pigment-producing organism is a Gram-negative rod, which on meningococcal medium produces medium-sized moist colonies more opaque than the meningococcus, but less opaque than the staphylococcus. Its characteristic is the blackish-brown smoky appearance it gives to the medium. It is possibly related to the pyocyaneus.

No particular study was made of this organism, as it was soon realised that it was only because of its "eye-catching," pigment-producing property that it had been recognised at all.

Other organisms were noticed to behave in the same way—for example, a Gram-negative rod giving a large slimy, white colony and a *Staphylococcus albus*. These organisms all had some outstanding feature about their colonies that rendered them readily recognisable, and it is probable that this was the reason that they were noticed. There is, however, great difficulty in telling when a man is finally ceasing to "carry," because of the apparent intermittency in carrying which is so noticeable in chronic carriers. It did not appear that there was any particular organism or group of organisms that had the power of ousting the meningococcus, but rather that there was some other factor, such as possibly the resistance of the patient to an organism, which permitted the organism to invade the "meningococcus-carrying site."

In the majority of carriers the meningococcus thus appeared to be ousted by some other bacterium. Occasionally, however, it is possible that the meningococcus was missed, while still present, owing to the invasion of the "carrying site" by an organism which microscopically was similar, but which gave agglutination with normal as well as specific sera; this organism is now generally known as a "flavus." The flavus may have been replacing the meningococcus, in the same way as the pigment-producing organism, or the flavus colonies may have been confused with the meningococcus colonies. This mistake, if it ever occurred, must have been very rare, for flavus colonies were very rarely picked in mistake for the meningococcus. In the last 1000 suspected meningococcus colonies examined by agglutination test, flavus colonies were only taken in error 47 times, or 4·7 per cent. We are inclined to believe that the flavus was ousting the meningococcus rather than that a mistake between the two colonies was made.

Very frequently towards the end of the time that a man was considered to be a carrier, an organism having the cultural and microscopic appearances of the meningococcus began to appear with frequency; no other alteration in the type of colonies on the plate was apparent. This organism, however, refused to agglutinate with any of the standard sera, and thus was not accepted as the meningococcus. Carriers who showed this type of organism were therefore discharged as free from infection. Two typical examples of this phenomenon are quoted. (Tables VA. and VB.)

"*A case carrier*" (Th.). Onset 10/10/18; carried continuously a Type II. coccus until 3/2/19. Every plate was proved positive, and during this time only 11 per cent. of his naso-pharyngeal cocci were non-agglutinating. His subsequent examinations were as follows:—

TABLE VA.

Date of examination.	Plate report.	Agglutination results. 1st colony.	2nd colony.	Result reported.
19/2/19	Negative.	—	—	Negative.
23/2/19	Typical colonies.	Negative.	Negative.	,,
4/3/19	,, ,,	Weak II.	,,	Positive.
11/3/19	Under treatment for a fortnight.	—	—	—
18/3/19	Pure culture.	Negative.	Negative.	Negative.
26/3/19	Typical colonies.	,,	,,	,,
2/4/19	,, ,,	,,	,,	,,
8/4/19	Pure culture.	,,	,,	,,
15/4/19	Typical colonies.	,,	,,	,,

TABLE VB.

Date of examination.	Plate report.	Agglutination results. 1st colony.	2nd colony.	Results reported.
3/2/19	Pure culture.	Negative.	Flavus agglut.	Negative.
10/2/19	,, ,,	,,	Negative.	,,
15/2/19	,, ,,	,,	,,	,,

"*A healthy carrier*" (Mi.). First found positive Type II. coccus 25/3/18; carried persistently until 27/1/19. 79·2 per cent. of the naso-pharyngeal plates were proved positive, and during this time only 15 per cent. of the colonies examined failed to agglutinate. Table VB shows his subsequent examinations.

It has already been stated that it is particularly towards the end of a man's period as a recognised carrier that these non-agglutinable organisms predominate. And it is chiefly owing to the presence of these organisms that the intermittency of a chronic carrier appears so marked. We believe that in the majority of instances, anyhow, this non-agglutinable organism is the meningococcus.

4. *Investigation of the Non-agglutinating Organism which Resembles the Meningococcus.*

A great deal of work has been done on organisms of this class; the only reason for publishing our observations is that we approach the subject from a different angle. It was early realised that from an apparently pure culture of the meningococcus on a plate many colonies could be picked which would not agglutinate on primary subculture with the standard sera. This can be realised better on examination of Table VIA, which includes the last 2167 plates found positive by agglutination tests; of these 107 represent cerebro-spinal fluids from acute cases, and 2060 post-nasal swabs from "case carriers" and "healthy carriers."

TABLE VIA.

—	Total positive plates examined.	Pure cultures. Total positive.	Positive in both colonies. No.	Positive in both colonies. Per cent.	Positive in one colony. No.	Positive in one colony. Per cent.	Non-pure cultures. Total positive.	Positive in both colonies. No	Positive in both colonies. Per cent.	Positive in one colony. No	Positive in one colony. Per cent.
C.-S. fluids...	107	107	65	60·7	42	39·3	—	—	—	—	—
Case carriers	365	108	58	53·7	50	46·3	257	134	52·2	123	47·8
Healthy carriers ...	1695	499	268	53·7	231	46·3	1196	661	55·3	535	44·7

The number of non-agglutinable colonies varied from man to man and from time to time, some men having few or none, others very many. If these plates had only been derived from the naso-pharynx it might have been thought that other organisms having similar colonies were present. But this was not so, as the plates from the C.-S. fluid of acute cases, taken with the greatest aseptic precautions, gave similar results, 19·6 per cent. of the colonies examined being non-agglutinable.

Again, compare the results obtained from pure naso-pharyngeal cultures with the results from impure cultures. In the impure culture it would be expected that there would be a greater chance of picking some other organism in mistake for the meningococcus. However, for case carriers 46·3 per cent. of the pure plates and 47·8 per cent. of the impure plates had non-agglutinable colonies; for healthy carriers 46·3 per cent. of the pure plates and 44·7 per cent. of the impure plates had non-agglutinable colonies, showing that the non-agglutinable colony is probably not of extraneous origin.

TABLE VIIA.

Type of carrier.	Per cent. of non-agglutinable colonies found.
I.	23·0 per cent.
II.	23·8 ,,
III.	21·4 ,,
IV.	32·6 ,,

(For these figures all colonies showing any group agglutination are excluded; only colonies absolutely monovalent have been counted.)

TABLE VIIIA.

—	Total colonies. Examined.	Non-agglutinating.	Per cent. Colonies non-agglutinating.
From case carriers ...	730	173	23·7
From healthy carriers ...	3390	766	22·6
Total	4120	939	22·8

The non-agglutinable colony does not appear more often in a carrier of any one particular type of meningococcus

than another; the high percentage under Type IV. can be discounted, as an insufficient number of Type IV. colonies were examined to get true figures. (Table VIIIA.)

From Table VIIIA. it appears that about 20 per cent. of the colonies taken for examination failed to agglutinate.

From Table VIA. it can be seen that from a total of 2060 plates 557 were positive in both colonies examined and 1453 in one colony out of two only. It is reasonable to expect that half of the 1453, or 726, would have been regarded as negative if only one colony had been examined instead of two. This would have led to only 1283 plates being regarded as showing meningococci, instead of 2060, and 726 or 36 per cent. of the plates would have been marked free from infection. Thus it is evident that one subculture from a plate is very unsatisfactory, and if it had been realised by us that the percentage of non-agglutinable colonies was so high, three instead of two colonies would have been subcultured as a routine procedure. We have, however, been in the habit of subculturing six or more colonies in carriers where it was known that non-agglutinable colonies predominated. Many carriers have by this means been proved to be carriers long after they would otherwise have been discharged on the grounds that no epidemic strains were found.

The non-agglutinable organisms are in many cases very closely related to, if not identical with, the meningococcus. Colonies have been obtained from the C.-S. fluid. cultures of acute cases which would not agglutinate when first tested. The sugar reactions of these colonies were typical; a saturation test showed that the colonies, though they did not agglutinate in the primary culture, were capable of removing agglutinin from a monovalent meningococcic serum, showing that they really were meningococci. Subsequently, after repeated subcultures, these non-agglutinable organisms could be made to agglutinate with one of the special type sera.

Many non-agglutinable organisms have been examined also from the naso-pharyngeal cultures. In by far the majority of instances we have been able to prove that they were meningococci. A typical example of this can be quoted from a chronic case carrier (Wi), Type I. Five colonies were examined, two serum dilutions only are quoted. (Table IXA.).

TABLE IXA.—*Agglutination Results.*

No. of colony.	Type of serum. I. 1/100	I. 1/200	II. 1/100	II. 1/200	III. 1/100	III. 1/200	IV. 1/100	IV. 1/200	Normal. 1/50
1. 1st subculture	–	–	–	–	–	–	–	–	–
12th ,, ...	++	++	+	–	–	–	+	–	–
2. 1st ,, ...	–	–	–	–	–	–	–	–	–
12th ,, ...	++	++	+	–	–	–	+	–	–
3. 1st ,, ...	–	–	–	–	–	–	–	–	–
12th ,, ...	++	+	+	–	–	–	+	–	–
4. 1st ,, ...	–	–	–	–	–	–	–	–	–
12th ,, ...	+	+	+	+	–	–	+	–	–
5. 1st ,, ...	–	–	–	–	–	–	–	–	–
12th ,, ...	++	+	–	–	–	–	+	–	–

Sugar reactions.—Glucose and maltose were rendered acid by the second day in all five colonies, and saccharose was untouched in four days. In some instances, although sugar reactions have been typical, we have never been able to obtain agglutinations with the standard monovalent sera, even after prolonged subcultivation. Saturation tests also were unsatisfactory; agglutination, however, could be obtained with a powerful treatment serum such as the M.R.C. Pooled Types I. and II. We have never felt certain how to regard these cocci, as it has been thought that the agglutination obtained has been due to group agglutinin in the powerful serum, and this might not be evidence that the cocci are capable of producing meningitis. Fildes[6] has drawn attention to the presence of cocci of this type, where he was able to obtain agglutination with a Flexner serum when agglutination to the four main epidemic types failed.

We have not been able to arrive at the exact percentage of non-agglutinable colonies which, if carried through all the above tests, could be subsequently proved to be meningococcus, owing to the enormous labour entailed, but it is certain that a very high percentage of these non-agglutinable colonies are really the meningococcus, which for some reason or other fails to respond at first to the specific agglutinin.

It is interesting that Glover[7] reports that he found a large number of non-agglutinable cocci in the naso-pharyngeal plates examined at X depôt. The technique for examination of these plates is not given. It would be interesting to know how many subcultures were examined from each plate, as the value of his results would depend upon whether one, two, three, or more colonies were subjected to agglutination tests. If his results are based upon the agglutination of one colony per plate, it is probable that if he had examined two or more colonies his carrier-rate would have been much higher.

The clearance of a meningococcus carrier is effected either by the replacement of the meningococcus by some other organism or by some change in the meningococcus whereby it loses its power of agglutinating with standard sera.

5. *Bacterial Replacement of the Meningococcus.*

Attempts have been made to free carriers from infection by the application of cultures of organisms which had been observed to replace naturally the meningococcus in other carriers. In this connexion various dangers have to be considered. It is always uncertain what effect an even apparently non-pathogenic organism may have on an individual, and in any case untoward occurrences following the application might always be attributed to the living organism used. Empyemata of the accessory sinuses of the nose or inhalation pneumonia are serious considerations. The pigment-producing Gram-negative rod, which, as far as we were then aware, was a non-pathogenic organism, was used in one chronic "healthy carrier." The culture was prepared and swabbed over the "meningococcus-carrying site." A most severe and alarming diarrhœa followed, which lasted for at least a week. That this organism was responsible for the trouble there can be no doubt, as a very carefully prepared pure culture was subsequently used on the same patient, again giving rise to the same symptoms; the patient remained a carrier of the meningococcus. The organism evidently did not "take" on the correct site. The above-mentioned possibilities discouraged further investigation on these lines, especially as it was felt that it was the resistance of the patient to the organism and not the organism itself which was the determining factor in permitting invasion and replacement of the meningococcus.

In order to see if replacement of the meningococcus would take place naturally more rapidly under no treatment at all, than under systematic treatment, sterile tap-water was supplied for use in the nasal atomisers, which were used twice daily exactly as they had been used before. The rate of clearing of carriers per month for five months before the treatment and for three months after treatment had commenced is given in Table XA.

TABLE XA.

Months.	Percentage of carriers discharged.	Treatment.
September, 1918 ...	24	Nasal disinfectant.
October, ,, ...	17	
November, ,, ...	24	
December, ,, ...	21	
January, 1919 ...	12	
February ,, ...	46	Tap-water spray.
March ,, ...	38	
April ,, ...	33·3	

This gives a very striking result, showing, as in Table IV., that disinfection does not aid in clearing carriers but prolongs the carrying period. It might be thought that the rate of discharge was influenced by the inclusion of a large number of acute carriers. That this is not so in this case is evident as the total number of fresh carriers admitted from September, 1918, to December, 1918, was 90, whereas the total number of fresh carriers from January, 1919, to April, 1919, was 55. January, 1919, is included in the second half, as carriers admitted during this month would influence the February rate of discharge.

We would thus conclude that meningococcus carriers tend to become free from infection more rapidly when not sub-

jected to any of the forms of nasal disinfection investigated, fresh air and exercise being the most beneficial forms of treatment. By this we do not mean to imply that there is no value in nasal disinfection, for in no instance in which nasal disinfection has once been started during an epidemic here has a further case of cerebro-spinal fever occurred. This we attribute to the fact that nasal disinfection is capable of destroying bacteria before they have gained access to the deeper tissues. We consider that it is the negative rather than the positive contacts that should receive nasal disinfection, and when once a carrier is discovered Nature, fresh air, and exercise should be prescribed.

No mention has been made hitherto of surgical interference with the naso-pharyngeal passages. In the first place it is difficult to persuade a carrier to have an operation when no definite promise of a cure can be given. Also there is probably a certain degree of risk of provoking cerebro-spinal fever by surgical manipulation of the "meningococcus-carrying site."

In a previous paper [7] we have shown that although hypertrophied lymphoid tissue may favour the production of a chronic carrier it is not the only cause of this condition, and no relationship between the degree of lymphoid hypertrophy and the length of the carrying period could be established. If we accept the idea that the meningococcus disappears from the carrying site when ousted by some other bacterium, it does not seem to us that surgical interference is indicated, because if the meningococcus can invade hypertrophied lymphoid tissue, so can equally easily organisms to replace it.

Conclusions.

1. Meningococcus carriers can be divided into two groups: (1) Acute or temporary carriers, those carrying under eight weeks; (2) chronic carriers, those carrying over eight weeks.

2. Acute or temporary carriers remain infectious on an average for 24 days; the maximum discharge-rate occurs during the third week.

3. Chronic carriers remain infectious on an average for 5½ months; the longest carrying period found was 634 days, or 1 year 9 months.

4. 80 per cent. of carriers are acute or temporary, 20 per cent. chronic.

5. The type of coccus carried rarely changes; in 905 carriers this was only observed to occur once.

6. Treatment of the carrier appears to prolong the carrying period.

7. The meningococcus remains in the "carrying site" until ousted by some other bacterium.

8. A large number of non-agglutinable organisms, otherwise indistinguishable from the meningococcus, are probably altered meningococci.

9. The best method of freeing a meningococcus carrier from infection is Nature, open air, and exercise.

The authors beg to acknowledge their extreme indebtedness to Miss M. Stephens and Miss I. Harmer for their able assistance in carrying out the technical details in connexion with this research.

References.—3. Embleton and Steven: The Persistence of Cerebro-spinal Fever Cases as Carriers of the Meningococcus, THE LANCET, May 10th, 1919. 4. Tulloch: Medical Research Committee, Special Report Series, No. 3. 5. Embleton and Bryant: Site of Carrying in Chronic Meningococcus Carriers (previous article). 6. Fildes: Medical Research Committee, Special Report Series, No. 17. 7. Glover: The Cerebro-spinal Fever Epidemic of 1917 at X Depôt, R.A.M.C. Journal, January, 1918.

Dr. T. N. Kelynack has been appointed by the Lord Chancellor a justice of the peace for the county of London.

UNIVERSITY OF MANCHESTER.—At the opening of the winter session the Vice-Chancellor, Sir Henry Miers, said that in spite of the violent dislocation of University studies during the war the registration of new students was now larger than ever. In the Faculty of Medicine alone there are at least 150 new entries, and a notably large increase of students in chemistry. The difficulty will be to find accommodation for the large influx of students. Great changes have taken place in the Senate, no less than ten professors having retired during the last academic year. Eight new chairs have been established during the same period, including a chair of psychology.

THE INSTABILITY OF RED BLOOD CELLS PRESERVED IN THE METHOD OF ROUS AND TURNER.

BY GEORGES DREYER, M.A., M.D.,
PROFESSOR OF PATHOLOGY, UNIVERSITY OF OXFORD;
AND
A. D. GARDNER, M.A., M.D. OXON., F.R.C.S. ENG., &C.,
BACTERIOLOGIST UNDER NATIONAL MEDICAL RESEARCH COMMITTEE, OXFORD.
(*From the Department of Pathology, University of Oxford.*)

IN 1916 Peyton Rous and J. R. Turner [1] described a method of preserving erythrocytes and stated that, under the conditions prescribed, the cells underwent no noteworthy change for a considerable period of time. "Cells kept for three weeks and for a month have been used for the Wassermann reaction, and compared with cells freshly obtained from the same sheep. They had the same hæmolytic titre and gave identical results in the reaction" (p. 227). And, again (p. 236), "The cells remain intact for about four weeks." It thus appeared that an important contribution had been made to practical serology. But their paper contains no adequate experimental demonstration of the accuracy of this statement. Nevertheless, it carried sufficient weight to lead a number of workers, and particularly J. S. C. Douglas and J. W. Bigger,[2] to assume its truth and to use this supposed fact as a basis for experiment. The last-named authors carried out a research designed to measure accurately the spontaneous deterioration of "complement"—i.e., the diminution of the power of fresh guinea-pig's serum to act together with a heated specific hæmolytic serum in hæmolysing sheep's red corpuscles. In order to express the rate of deterioration, as measured in their experiments, they made use of an empirical formula which had been suggested by Madsen in 1902 [3] for calculating the rate of disappearance of antibodies from the circulation into which they had been injected.

A critical examination of the experimental data and theoretical calculations made it appear probable that at least two variable factors were concerned in the results obtained, the one being a change in sensitiveness of the preserved red cells, the other a steady weakening of the "complement." It was to test the validity of this view that the following series of experiments was undertaken.

Experimental Details.

A blood suspension was made exactly in the manner described by Rous and Turner in sufficient quantity to last for the whole series of experiments. Three parts of fresh venous blood from a human being were mixed with 2 parts of a 3·8 per cent. solution of sodium citrate in distilled water, and to this mixture was added 5 parts of a 5·4 per cent. solution of glucose in the same solvent. The glucose and the citrate solutions had been autoclaved separately. Full precautions were taken to ensure sterility. The emulsion was well shaken and then distributed into some 20 small bottles, the insides of which had been coated with paraffin wax to exclude the possible chemical action of soluble substances in the glass.

It is well to mention here that on every occasion when one of these bottles was opened a loopful of the suspension was sown into a tube of nutrient broth, which was then incubated for at least three days. On no occasion did any bacterial growth appear in the culture-tube. For every experiment the blood suspension was diluted to such a degree that 1 c.cm. contained always the same absolute quantity of hæmoglobin. This was secured by readings of the colour-strength of the hæmolysed suspensions in a Dubosq colorimeter.

The actual dilution employed in the experiments was one part of Rous-Turner suspension to approximately 29 parts of 0·85 per cent. NaCl solution. A certain variation in the different experiments was necessary in order to secure a constant amount of hæmoglobin in each unit volume on the different occasions, for otherwise errors would be introduced owing to the inequality of samples taken from the same or from different bottles of the suspension.

As a standard for the preparation of the diluted emulsion for any experiment a sample of that used in the last experiment was preserved in the cold store—a procedure that has been used by one of us (G. D.) in previous researches, and has been proved to give very accurate results. As hæmolytic agent pure saponin (Grübler) was used. To secure constancy, a fresh solution was made on each occasion by

weighing out 10 mg. of dry saponin (kept in a closed box with $CaCl_2$) on a fine chemical balance and dissolving this in 100 c.cm. of sterile 0·85 per cent. NaCl solution in a dry measuring flask. This was found necessary because a definite though slight diminution in the hæmolytic effect of a 1/10,000 saponin solution in saline could be regularly demonstrated within 24 hours at temperatures of 5° C. or lower.

The detailed technique of measurement which has been used by us for years, and was also employed by Douglas and Bigger, is as follows:—

Where a full curve of hæmolysis from "total" to nothing was to be determined, a series of 13 test-tubes was employed. Into the tubes were measured the following quantities of saponin solution diluted 1/20,000: 1·0, 0·8, 0·6, 0·5, 0·4, 0·35, 0·30, 0·25, 0·20, 0·17, 0·13, 0·10. In each tube the quantity of fluid was made up to 1·0 c.cm. by the addition of NaCl. solution. Tube 13 acted as a control for spontaneous hæmolysis, containing no saponin, but only 1 c.cm. of saline. Two or more duplicates of this tube were measured out and preserved as standards for making the diluted suspensions in the next experiment. To each tube of the series was then added 5·0 c.cm. of the blood suspension diluted to standard Hb content. In measuring the suspension full attention was paid to the necessity for continuous gentle agitation of the containing vessel while drawing the sample. Without this precaution it is impossible to secure even distribution of the red cells. After the addition of the suspension the tubes were all shaken and placed in a water-bath at 37° C., where they were kept for two hours. At the end of this period the tubes were shaken and the contents at once centrifugalised until a supernatant fluid entirely free from corpuscles could be poured off. The readings of the degree of hæmolysis were then made in a Dubosq colorimeter using a control tube fully hæmolysed by an excessive dose of saponin, as the standard solution representing 100 per cent. hæmolysis.

As seen from the tables in some of the experiments, only a certain number of the tubes representing the full series were set up, for these few gave all the desired information. For the sake of further control, a number of the experiments were carried out in duplicate, with emulsions made from two bottles of the original suspension. The experiments extended over a period of 27 days from the day the blood was drawn and the suspension made. In Douglas and Bigger's experiments the period was some 16 days—the minimum period for which they claim that the blood remains nearly constant.

Results of Experiments.

The results of the successive tests are given in Table I. and are illustrated by Diagrams 1 and 2. In the first diagram there is graphically represented the increase of hæmolysis caused from time to time by a constant dose of saponin (0·25 c.cm. of a 1/20,000 solution). The second diagram represents the quantities of saponin required on the various occasions to produce 60 per cent. of hæmolysis—i.e., the degree of hæmolysis chosen by Douglas as standard for his comparative tests. From Table I. and Diagram 1 it is seen that the longer the suspension is kept the greater is the degree of hæmolysis caused by the same dose of saponin. Thus, while 0·25 c.cm. on the first day of experiment only caused 3·1 per cent. of hæmolysis (i.e., only a slight trace), on the fourteenth day the same dose caused 53·3 per cent. hæmolysis, and on the twenty-seventh day 87·6 per cent., which almost corresponds to total hæmolysis when the tube is merely inspected with the naked eye.

TABLE I.—*Percentage of Hæmolysis caused by Various Quantities of Saponin on a "Rous" Blood Suspension (Human) at Various Intervals up to a Month.*

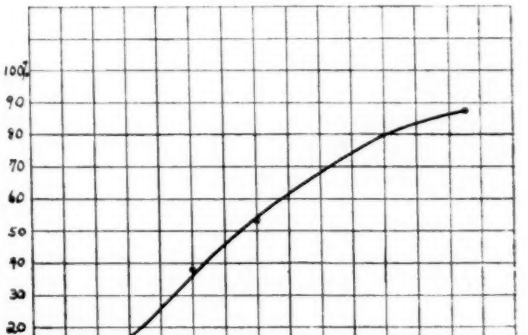
C.cm. of saponin.	Days (1 = the day on which the "Rous" suspension was made).					
	1	3	6	10	14	27
0·500	97·1	—	—	—	—	—
0·400	95·2	—	—	—	—	—
0·350	86·2	94·4	—	—	—	—
0·325	—	84·7	—	—	—	—
0·300	59·2	65·8	71·6	84·4	97·5	100·0
0·275	—	45·6	42·5	59·9	85·5	—
0·250	3·1	8·3	13·1	38·0	53·3	87·6
0·225	—	Trace (−)	—	10·3	14·9	—
0·200	Trace (−)	—	—	—	—	46·1
0·170	—	—	—	—	—	—
0·130	—	—	—	—	—	—

N.B.—For each experiment a fresh saponin solution was made from the dry solid.

TABLE II.—*Comparison of Hæmolytic Powers of a Fresh 1/2000 Saponin Solution with a Similar Solution Five Days Old.*

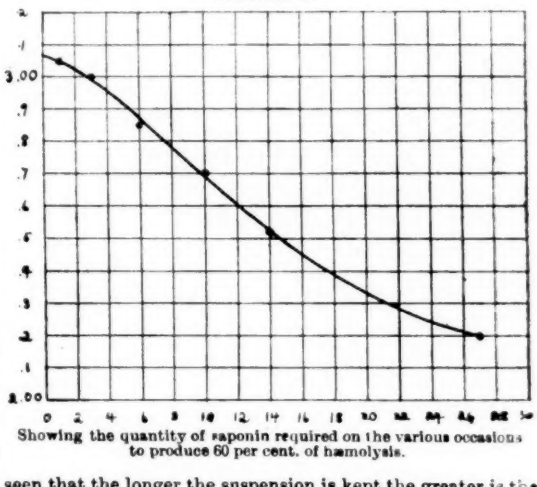
Doses in c.cm. of the saponin solutions.	Per cent. of hæmolysis.	
	Fresh saponin.	Five days old saponin.
0·300	66·1	54·8
0·275	41·5	18·6
0·250	18·8	6·6

DIAGRAM 1.



Showing the increase of hæmolysis caused by a constant dose of saponin.

DIAGRAM 2.



Showing the quantity of saponin required on the various occasions to produce 60 per cent. of hæmolysis.

It is thus evident that the sensitiveness of the red cells of the Rous and Turner suspension in no sense remains constant, as claimed by Douglas, but undergoes a steady and very considerable increase in sensitiveness to hæmolytic agents from day to day. It follows that were such a suspension used for the complement-fixation test, the same serum might on the one occasion give a definite positive reaction, while some few weeks later the reaction would appear to be negative.

In Diagram 2 the ordinates are the doses of saponin (diluted 1/20,000) expressed in decimals of a c.cm. and the abscissa represent the age of the suspension in days. The general form of this curve is seen to be the inverse of the curve in Diagram 1. We see that the dose required to produce the same degree of hæmolysis decreases gradually and regularly as the age of the suspension increases. This again demonstrates the regular increase of sensitiveness of the cells as the suspension grows older.

From the data given it can only be deduced that the statement made by Douglas—that "the susceptibility of such cells to hæmolysin, although somewhat increased during the first 48 hours, subsequently appears to remain nearly constant for a greater length of time than that covered by our experiments"—is not in correspondence with the facts. This statement would indicate that the change in sensitiveness is rapid in the first 48 hours, and then becomes so slow as to be negligible. A study of our table and diagrams shows that the change for the first two or three days is slower than on the subsequent days, and there is an indication that it becomes somewhat slower again in the later stages. In this connexion it is worth mentioning that a week or two after our last experiment the Rous-Turner suspension was found to show very marked spontaneous hæmolysis in all bottles, though their contents were proved to be absolutely sterile.

Solutions of Saponin.

Before concluding a few further remarks may be made on the subject of saponin solutions. In Table II. there is presented an experiment which demonstrates the instability of saponin in dilute solution.

Two precisely similar solutions (1/20 000), one fresh and the other five days old, were tested upon one and the same suspension of erythrocytes. It is seen that in three different doses the old solution is much less strongly hæmolytic than the fresh. Similar tests were done on a number of occasions, and then always gave the same result.

These findings furnish an admirable example of the truth that in all scientific work it is inadmissible to make assumptions as to the qualities (such as stability) of the materials employed. Such assumptions must be put to the test of experiment if the worker is to avoid the pitfall of false deduction.

Conclusions.

(1) By means of Rous and Turner's method it is not possible to obtain a standard suspension of red cells of constant sensitiveness to hæmolysins.

(2) Therefore the use of such suspensions as a standard unchanging material for experimental work or for routine complement-fixation tests would necessarily lead to erroneous results.

Note.—Since the completion of this paper an article by Dr. J. W. Bigger has appeared in the *Journal of Pathology and Bacteriology* (May, 1919), describing further experiments on lines similar to those of Douglas and Bigger. In that article some observations are recorded which are in full agreement with our results, though a full inquiry into the question of the stability of "Rous" suspensions was not carried out.

References.—1. Peyton Rous and J. R. Turner: Journal of Experimental Medicine, vol. xxiii., 1916, p. 219. 2. J. S. C. Douglas and J. W. Bigger: THE LANCET, July, 1918. 3. T. Madsen: Festskrift ved Indvielsen af Statens Serum-Institut, Copenhagen, 1902.

THE PROGNOSTIC IMPORTANCE OF TUBERCULOSIS OF THE LARYNX.*

BY SIR STCLAIR THOMSON,

PROFESSOR OF LARYNGOLOGY IN KING'S COLLEGE HOSPITAL; LARYNGOLOGIST TO KING EDWARD VII. SANATORIUM, MIDHURST.

AT the present moment the tuberculosis question is of ever-increasing urgency, for a study of statistics would tend to demonstrate that the death-rate has not only ceased the steady decline it had been pursuing for many years, but that since the year 1912 it has been steadily rising.

The early diagnosis of tubercle is of primary importance. But only secondary to it is the value of prognosis. On this to a large extent is based our care of the case, and the hopes we can hold out of cure or arrest. Besides, if we can see into the future with the eyes of to-day we can help in any plan of campaign, so as to obtain the greater value from it, and avoid the useless expenditure of energy, time, and money.

What can the laryngologist do in this direction? I would at once reply that he can do so much that I hold that every case of pulmonary tuberculosis, and every suspected case, should be examined by a skilled laryngologist not once only, but at regularly recurring periods; every tuberculosis sanatorium should have a laryngologist on its regular staff, and every laryngologist should embrace any opportunity that may come his way of examining the throat in consumptive patients.

In a few cases tuberculosis can be diagnosed in the larynx before it has sufficiently advanced elsewhere to cause any physical signs. One such patient now under my care has been one of the Allied plenipotentiaries in Paris since the beginning of the Peace Congress, and was sent to me as a case of laryngeal cancer. Another was under observation, in and out of a sanatorium, for three whole years before my diagnosis of his laryngeal condition was confirmed by signs in his chest; he still has no T.B.'s. Another, a medical man, died from tuberculosis in his larynx and pharynx without a pulmonary physical sign. These cases are quoted to show the responsibility which the laryngologist may have to bear in the matter of diagnosis and prognosis.

Analysis of the Midhurst Results.

In the last eight years I have examined the larynx in 1750 patients admitted to a sanatorium for tuberculosis. So as to be able, as far as we can, to see what the end-results are, I have limited my present investigations to the cases examined during the four years from July 1st, 1911, to June 30th, 1915. Hence, I can deal with the after-histories of these cases for a minimum of three years after leaving the sanatorium, while in some cases the after-history extends over a period of seven years. In this way we can obtain much more definite and reliable results than if we simply recorded the condition of the patient on discharge.

At the King Edward VII. Sanatorium, at Midhurst, we have a well-worked system by which we obtain a report as to each patient's condition once every year after his discharge. Every case is therefore followed all the years of his life, and till his death is recorded. In our island kingdom this task is doubtless easier than on large continents, and so enables us to produce some records which other countries might have no opportunity of securing.

Now, what may we learn from the after-history of over a period of three to seven years of the 883 consumptive patients whom I examined first between the years 1911 and 1915, and how does this after-history differ if we separate these 883 patients into (*a*) non-laryngeal cases and (*b*) laryngeal cases?

This is at once shown by reference to Tables I. and II.:—

After-History up to June 30th, 1918, of 883 Patients Examined between July 1st, 1911, and June 30th, 1915.

TABLE I.—*Non-Laryngeal Cases.*

(A) Number of cases. (B) Died from tubercle. (C) Died from other causes. (D) Percentage of deaths from tubercle.

Group.	Males.				Females.				Both sexes.			
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
I.	109	19	1	17·4	71	9	2	12·7	180	28	3	15·6
II.	236	95	5	40·3	109	36	1	33·0	345	131	6	38·0
III.	85	61	—	71·8	77	53	—	68·8	162	114	—	70·4
Total ..	430	175	6	40·7	257	98	3	38·1	687	273	9	39·7

TABLE II.—*Laryngeal Cases.*

(E) Number of cases. (F) Died. (G) Percentages.

Group.	Males.			Females.			Both sexes.		
	(E)	(F)	(G)	(E)	(F)	(G)	(E)	(F)	(G)
I.	11	5	45·5	3	1	33·3	14	6	42·9
II.	53	38	71·7	37	19	51·4	90	57	63·3
III.	54	43	79·6	38	29	76·3	92	72	78·3
Total.	118	86	72·9	78	49	62·8	196	135	68·9

(I should explain that at Midhurst every case, on admission, is placed in one of three groups, according to the Turban-Gerhardt method of classification. Briefly stated, a patient is placed in Group I. if the disease is limited to a small area of one or both apices; these are the slight cases. Group II. embraces cases more extensive than Group I., but affecting,

* Being the substance of an address delivered before the American Laryngological Association, in Atlantic City, N.J., on June 16th, 1919.

at most, the whole of one lobe or severe disease extending at most to the half of one lobe; such cases would still be called of moderate severity. Group III. includes all cases of greater severity than Group II. and all those with considerable cavities; these are more serious cases.)

Conclusions to be Drawn.

Looking first at Table I.—the non-laryngeal cases—we note that of course the percentage of deaths is lowest in the cases of Group I., that it is more than doubled in Group II., and that in Group III. 70 per cent. are dead within seven years. Of all three groups together and both sexes 39·7 per cent. have died within this period of observation.

Now, comparing with these results the cases in Table II.—i.e., those with the larynx involved—what do we find? The first thing which strikes us is that the prognosis as shown by the percentage of deaths is rendered graver in both sexes and in all three groups. In the case of Group I. the percentage rises from 15·6 per cent. to 42·9 per cent., and in Group II. it rises from 38 per cent. to 63·3 per cent. In Group III. the increased mortality is not so striking—viz., from 70·4 per cent. to 78·3 per cent.—and this is what we would expect—viz., that in advanced cases the outlook is already so serious that a further addition to it is not noticeable. Taking all three groups together the presence of tuberculosis in the larynx raises the percentage of deaths during the 3-7 year period from 39·7 per cent. to 68·9 per cent. Put in other words, amongst all the fairly early cases of pulmonary tuberculosis admitted to a sanatorium the expectation is that 60 per cent. of them will be alive in three to seven years later. But of similar sanatorium patients with the larynx diseased only 30 per cent. will be alive at the end of that period.

We also note in Table II. that, just as in non-laryngeal cases, the percentage of deaths is higher in Group II. than in the early cases of Group I., and still higher in the advanced cases in Group III. But it is very striking to observe that the ratio of the death-rate in these three groups to one another is no longer the same as in Table I., for in Group II. the deaths are no longer more than double those of Group I., but only half as many again; and in Group III. the frequency of death is only slightly in excess of the figures of Table I. Moreover, whereas in the non-laryngeal cases the death-rate of the early cases of Group I. was less than a fourth of those in Group III., we see that in the laryngeal cases of Group I. the proportion of deaths has risen to more than a half of those in Group III. This surely shows that, even in a slight and early case of pulmonary tuberculosis—a Group I. case—the detection of a laryngeal lesion renders the prognosis more gloomy than in a case of more advanced pulmonary infection with a free larynx. Put in another way, if a case, whose pulmonary condition warrants the patient being classified in Group I., is discovered to have a laryngeal lesion, this would at once grade him down to Group II. It also demonstrates that in cases whose pulmonary condition would place them in Group II., so that only 38 per cent. would be dead within seven years, the involvement of the larynx lowers their prognosis to nearly that of the Group. III. cases, and 63·3 per cent. will be dead within the period of observation.

Other conclusions might be drawn from these tables, as for instance, that—

The proportion of laryngeal cases amongst all admissions to a sanatorium is	22·2%
The incidence of laryngeal disease amongst males being ...	21·5%
The incidence of laryngeal disease amongst females being	23·3%

We might even refer to the greater mortality amongst males than amongst females, whether with or without laryngeal lesions. But I refrain from the temptation to squeeze too much out of insufficient material, particularly as I hope to publish, later on, a study founded on 10 years' sanatorium work.

As, at all stages of pulmonary tuberculosis, so much depends on the prognosis, it is sufficient if I have shown the importance of a skilled examination of the larynx. One glance into a laryngeal mirror will often show that—

> "a man may prophesy,
> With a near aim, of the main chance of things
> As yet not come to life"—(*Henry IV.*, Part 2, iii., 1)

much more correctly than he can from all other clinical investigations without it.

A CASE OF
ANKYLOSTOMA DUODENALE
WITH PYLORIC OBSTRUCTION.

BY H. K. V. SOLTAU, M.B., B.S. LOND.,
CAPTAIN, R.A.M.C. (S.R.).

Introductory Note on the Case by

COLONEL SIR CHARTERS SYMONDS, K.B.E., M.D., M.S., F.R.C.S.,
LATE CONSULTING SURGEON TO THE SOUTHERN COMMAND.

THE pyloric obstruction was the obvious cause of the vomiting in the case recorded below, and the movable mass to the right of the median line suggests a new growth. A new feature was, however, presented when the patient passed large masses of the ova of the *Ankylostoma duodenale*. These were sufficient to give a definite character to the stools and attract the notice of the nurses. Though the evacuation was not accompanied by any change in the tumour, the question arose whether there might not be ulceration caused by the ankylostoma with surrounding induration.

Clinically the mass resembled a pyloric cancer in outline, mobility, and situation, but might equally well be due to induration round an ulcer. Though malignant disease may occur early in the pylorus—there are several cases recorded under 30 and one at 24—his age was in favour of an ulcer, as was the hæmatemesis. The findings at the operation, fully described by Captain Soltau, support the non-malignant character of the enlargement. The disease was strictly limited at the pylorus, and involved both aspects of the stomach; it also extended for an inch or more along the lesser curve, resembling in this respect a malignant growth. The white plaques described by Captain Soltau were small, quite flat, not raised so as to be felt, and were scattered over the indurated area. They resembled those seen in simple inflammatory conditions rather than the nodules of cancer or tubercle. Another point against cancer was the absence of enlarged and cord-like lymphatics passing towards the lesser curvature. These infected lymphatics are usually present in such extensive disease, and their absence I would take as strong evidence in favour of simple ulceration. The palpable glands were oval in shape, elastic, and few in number. The small, hard, numerous glands so characteristic of malignant disease were absent. The gastro-hepatic omentum had not become thickened and shortened as in some pyloric ulcers. This, when advanced, anchors the tumour and may draw it up so far as to render it impalpable. When such an omentum is found at an operation, especially if the surface be smooth, a favourable view is justified. Lastly, the adhesion to the gall-bladder and liver is in favour of a simple condition, more especially as there were no nodules bordering on these adhesions.

Account of Case.

The patient whose history is here related was admitted to hospital in England in April of this year, after evacuation from the Egyptian Expeditionary Force.

J. G., a man of 22, had been in Egypt for the previous 18 months. In June, 1918, he was admitted to hospital with symptoms of dysentery—diarrhœa, with stools containing blood and mucus. Improvement followed a course of emetine, but after four weeks out of hospital he was readmitted in December with the same symptoms as before, but also with hæmatemesis, which continued for three days. Vomiting continued off and on for the next five months, but there was no more hæmatemesis, and the dysenteric symptoms soon ceased. On admission to hospital in England the patient presented an extremely anæmic and emaciated appearance. Weight just over 6 st. He complained of pain in the epigastric region and of vomiting. No diarrhœa. No blood in stools, but flecks of mucus present. The pain was referred to the pyloric region; it was sharp in character and worse at night, but occurred chiefly about an hour after feeds, and was relieved by a further drink of milk. Vomiting occurred once every 24 hours and consisted of the partially digested food of previous meals, but no blood. With daily stomach lavage this improved, until vomits recurred only at two- or three-day intervals. Examination of his abdomen revealed marked tenderness and resistance in the right hypochondrium. A rounded swelling could be felt, inti-

mately connected with the lower border of the liver and extending towards the middle line and slightly upwards, along the line of the lesser curvature of the stomach. Liver not enlarged. Spleen not enlarged. Urine normal. No œdema of ankles. The stools were formed, but contained numerous flecks of mucus. Bacterial examination on April 17th showed: "Absence of pathogenic bacteria, but large numbers of ova which, on cultivation, yielded the typical rhabditiform larvæ of *Ankylostoma duodenale*."

Thymol treatment—gr. 30 in two doses, preceded by sod. bicarb. and followed by mag. sulph.—was given. Three days later ova were still present, and thymol was again given. The stools were negative, but ova were again present on May 2nd. After two more days of thymol all subsequent examinations of stools were negative.

Examination of blood on May 5th showed:—Reds: 2,976,000 per c.mm. No abnormal cells or parasites present. Hæmoglobin, 60 per cent. Colour index, 1·03. Leucocytes: 5486 per c.mm. No abnormal cells. Polymorphonuclears, 72 per cent.; lymphocytes, 22 per cent.; eosinophiles, 0 per cent.; large mononuclears, 3 per cent.; transitionals, 3 per cent.; mast cells, 0 per cent.

Although apparently free from hookworm infection, the patient's condition did not improve. The vomiting increased, and the abdominal tumour became much more obvious. Waves of contraction from the cardiac end of the stomach could be seen passing down to it. Accordingly an exploratory laparotomy was decided on, the provisional diagnosis being: "Pyloric obstruction, due to an inflammatory mass following ulceration in duodenum or pylorus caused by hookworms; probably requiring gastro-enterostomy."

Operation.

On May 26th the abdomen was opened. There was no free fluid in the general peritoneal cavity. Extending from the duodeno-pyloric junction towards the mid-line and involving the lesser curvature for about 2½ inches was a large mass firmly adherent to the liver, gall-bladder, and pancreas. On the surface and extending on to the anterior surface of the stomach were many small white irregularly shaped patches resembling in appearance an aphthous stomatitis. These patches were not raised or hard. No enlarged glands were felt in the mesentery, but the glands in the lesser gastro-hepatic omentum were palpable. In order to relieve his obstruction, posterior gastro-enterostomy was performed. The result was most encouraging. The patient only vomited once, soon after the operation, and never looked back. On June 30th his weight was 7 st. The tumour could then still be felt and did not seem to have altered in size or shape.

A blood examination at that time showed a marked improvement:—Reds: 4,624,000 per c.mm.; hæmoglobin, 60 per cent.; colour index, 0·65. Leucocytes: 8750 per c.mm.; polymorphonuclears, 66·5 per cent.; lymphocytes, 27·0 per cent.; eosinophiles, 0·5 per cent.; large mononuclears, 5·5 per cent.; transitionals, 0·5 per cent.; mast cells, 0·0 per cent. The patient steadily improved, and his weight was considerably over 8 st. when he left hospital in July.

Points of Interest.

The following points are of interest: 1. The onset, with dysenteric symptoms and improvement under emetine. 2. The hæmatemesis two months later, which lasted for three days only and never recurred. 3. The presence of a tumour—probably a direct result of the invasion of the pyloric wall by the hookworm—causing obstruction. 4. The distribution and character of the tumour. 5. The amount of thymol which had to be given before a final negative result was obtained—two doses of gr. 30 each are sufficient in nearly 90 per cent. of all cases. 6. The similarity between the blood count and that of pernicious anæmia, the diminution of reds and the high colour index, and the marked improvement of the anæmia as the result of the relief of the obstruction. 7. The complete absence of eosinophilia.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The following elections to scholarships, each value £50, have been made: Pathology and Pharmacology Scholarship, H. A. Osborn; Anatomy and Physiology Scholarship, R. O. Lightwood; Arts Scholarship, A. L. Moorby; Science Scholarship, L. I. Hyder.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A general meeting of the association will be held at 11, Chandos-street, Cavendish-square, W., on Friday next, Oct. 24th, at 4.30 P.M., when Dr. A. A. Mumford will read a paper on the Standardising of Physical Efficiency during Growth, and Colonel Martin Flack, R.A.F., will open a discussion upon the subject. All interested are invited to the meeting.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY: SUBSECTION OF ORTHOPÆDICS.

Exhibition of Cases and Specimens: Coxa Vara after Reduction of Congenital Dislocation of Hip.

A MEETING of this section of the Royal Society of Medicine was held on Oct. 7th, Mr. E. MUIRHEAD LITTLE, the President, being in the chair.

Mr. E. LAMING EVANS showed a case of Coxa Vara after reduction of congenital dislocation of hip.

The patient was 12 years of age. In March, 1913, Mr. Evans had reduced by manipulation a left-sided congenital dislocation of the hip. The reduction presented no difficulty, and an X ray examination after reduction showed no evidence of trauma, either at the epiphyseal line or in the neck of the femur. Retention was effected by a series of short unilateral plaster spicas in 90 degrees of abduction and 50-70 degrees of flexion for 18 months. This degree of flexion was necessitated by a tendency to anterior transposition. During the last 12 months of plaster retention the child walked on a 5-inch patten on the left or affected leg. After the plaster was removed a 1½-inch patten was used on the sound side to maintain abduction of the affected side. When the plaster was removed the affected leg measured 20¾ inches, and the sound leg 21 inches. The child had been kept under observation, and a series of 12 X rays had been taken during the 6½ years of treatment. Six years after reduction the left leg measured 25½ inches, and the right 26 inches. Six months later the difference had increased to ½ inch, and the X ray showed a varal deformity of 100 degrees, occurring at the junction of the neck and great trochanter. The epiphysis was seen correctly placed upon the neck, and situated correctly in the acetabulum and underlying a well-formed roof. The occurrence of coxa vara after reduction of congenital dislocation of the hip had an important bearing upon the functional result of a successful reduction. It produced a limp from shortening of the leg and from gluteal insufficiency, which, though of different origin and of lesser severity than that of unreduced dislocation, was, nevertheless, regrettable, and should be avoided if possible. The recognised causes had been classified under five heads: (1) trauma inflicted at the time of reduction, either upon the epiphysis or on the femoral neck; (2) prolonged weight-bearing, either before or after reduction; (3) absence of ossification in the head of the femur; (4) absorption of the ossific centre, which had appeared; (5) acute traumatic reflex atrophy. That coxa vara was a not uncommon complication of successful reduction of congenital dislocation had been shown by Joachimstal, Horvath, and others. The points of interest in the present case were the remote period—i.e., six years—after reduction and the site of bending, which was at the junction of the neck and great trochanter. The functional disability with 100 degrees of varal deformity was slight, but necessitated further observation and treatment by a perineal crutch if it proved to be progressive.

Mr. H. A. T. FAIRBANK thought that the X ray suggested the presence of injury to the neck of the femur close to the epiphyseal line which might have influenced the coxa vara later. An increase in the inferior surface of the neck which was frequently seen in these cases often gave the appearance of coxa vara. With regard to treatment, he thought that the indication was to keep the weight off the leg.

Sir C. GORDON WATSON thought that the condition corresponded to a rickety softening with bending of the neck at the junction of the neck with the shaft.

Congenital and Paralytic Scoliosis.

Mr. P. B. ROTH showed two cases of Secondary Scoliosis, the one due to paralysis of the erector spinæ, the other to congenital malformation of the spine.

The first case was that of a child, aged 8 years, who was first seen by Mr. Roth at the end of 1918. She had been strong and healthy until the latter part of 1916, when, after a few days' drowsiness and loss of appetite, followed by feverishness and vomiting, she was found to be completely paralysed in both legs and was taken to hospital, where she was under treatment for two years. She had massage for the legs, and after spinal curvature developed was ordered a jacket, and later was put into plaster-of-Paris. The deformity had become very marked. On examination there was found severe paralysis of the right erector spinæ muscle and scoliosis, with the convexity to the right; there was deformity of the right ribs posteriorly, whilst the upper

part of the trunk overhung the lower part to the right. A tracing was taken of the amount of rib deformity, and daily treatment by posture and exercise begun. She was not allowed to walk about, but spent the day lying in a spinal carriage, either supine or prone, with her body supported on her elbows and a cushion under her chest. She was allowed to sit up to the table for meals. She had been taught to swim, and could now swim several times across the bath. She was much stronger than when first seen, and there had been no increase in the amount of structural deformity of the ribs.

The second case was that of a child, aged 5 years, who was first seen at the end of 1918, when there was found an S-shaped scoliosis with deformity of the left ribs posteriorly and a moderate amount of projection backwards of the right erector spinæ in the lumbar region. She could be placed in a very much improved position and could voluntarily retain it. An X ray showed that an extra half vertebra carrying a rib was interposed on the left side between the eleventh and twelfth dorsal vertebræ, and that only the right half of the ninth dorsal vertebra was present, it being fused with the body of the tenth; four ribs, two on each side, sprang from the fused mass. Other abnormalities were also present. A tracing having been taken of the amount of deformity, treatment by posture and exercise was started at the beginning of 1919. She now held herself in excellent position. The rib deformity had not increased. The two cases were shown, Mr. Roth said, to demonstrate that the progress of deformity might be arrested without resorting to mechanical support.

Mr. A. S. BLUNDELL BANKART, in discussing the second case, said that the time would have to come when treatment must be stopped. The permanent scoliosis would remain and would then require support, and this might as well be applied now as later.

Mr. LAMING EVANS said that in paralysed cases the same principle should be applied as in cases of poliomyelitis of the legs, in which the overstretching of the paralysed muscles was prevented. This should be done by a support.

Mr. FAIRBANK said that in congenital malformations a distinction should be drawn between the primary scoliosis due to malformation, and the secondary curves, which might develop at any age, were not marked in small children, and were worse in older patients. A careful watch should be kept on cases of this kind to prevent deformity, if possible, and to take active measures to avoid it increasing. The treatment should be the same as that for any other variety of scoliosis.

Mr. R. C. ELMSLIE thought that two mechanical defects had been overlooked. One was that the right lower limb was shorter than the left; the other that the centre of gravity fell outside the pelvis, so that the weight was thrown on the paralysed muscles. He would apply a mechanical support so as to bring the centre of gravity over the centre of the pelvis, and then carry out muscular treatment.

Mr. ROTH, in reply, said that the mother had told him that the child had been treated as Mr. Elmslie had described. He agreed with Mr. Evans that the principle applied in infantile paralysis should be observed, but that after several years something active should be done. If the deformity had got worse after treatment he would have put on supports.

Infantilism.

Mr. R. C. ELMSLIE showed a case of Infantilism.

The patient, a female child aged 15 years and 10 months, was said to have been a healthy baby, but at the age of 1 year and 9 months had had diphtheria, and after this had suffered from gastro-intestinal disturbances until about the age of 13 years. Her general health was now excellent. She was only 3 feet high. The head measured 20 inches, the spine was scoliotic, with right dorsal and left lumbar convexities; there was coxa vara with limited abduction in both hips, slight genu valgum, and anterior curvature of the tibiæ. X rays of the hip showed coxa vara deformity of the rickety type. Those of the epiphyses at the wrist showed cupping of the ends of the diaphyses and widening of the epiphyseal regions as in rickets; those of the tibiæ showed a general lightness of the bone, with very thin compact layer. There was no sexual development. The urine contained a trace of albumin. There had been no opportunity to investigate the child's metabolism. Two conditions were present which might give rise to infantilism: one was that of chronic gastro-intestinal disturbances, and the other that of slight albuminuria. In which group should this case be placed?

The PRESIDENT said that the child had been an in-patient under his care when she was 12 years old, and was treated as a case of extreme rickets. The deformities were corrected by splints.

MEDICAL SOCIETY OF LONDON.

The President's Address.

A MEETING of this society was held on Oct. 13th, Mr. V. WARREN LOW, the President, being in the chair.

The PRESIDENT, in his opening address, referred to the advances which had been made in surgery during the war, and said that much of the time of the medical societies would be occupied for some years to come in digesting the war experiences and in seeing how far they applied to conditions of peace. A long period of clean surgery had found the surgeon quite unprepared for the septic wounds which were incidental to the war and had led at first to much confusion of thought and the abandonment by many surgeons of their customary technique; but as time went on the treatment of septic wounds became more standardised, and the value of free excision of infected tissue and early suture of wounds had gradually become recognised. The war had established beyond doubt the value of prophylactic injections of antitetanic serum and had demonstrated the existence of local tetanus, hitherto unknown. Advances had been made in the study of surgical shock, the researches on which would have a permanent significance. The conservative surgery which the exigencies of the South African war had imposed had been reversed under the novel conditions of the last war, early operation or exploration after intraperitoneal injuries having been shown to be the safe and proper procedure. It had been proved, also, that no mechanism designed for the conduct of operations under modified pressure was necessary in thoracic surgery. Opinions as to the wide field of usefulness for local anæsthesia had been fully justified. Great advances had been made in the treatment of fractures. Splints suitable for particular cases had been procurable, and this close coöperation between surgeon and mechanic embodied a principle which should continue under peace conditions.

Dr. F. DE HAVILLAND HALL read a paper on

Angina Pectoris with Low Blood Pressure.

He said that ever since the epoch-making discovery of Lauder Brunton in the year 1867 that anginal pain in a patient with aortic regurgitation was relieved by the inhalation of nitrite of amyl, drugs having a vaso-dilator action had been much employed in cases of angina pectoris. Their employment had been justified on the view that the immediate exciting cause of a paroxysm of angina pectoris was a sudden rise in the tension in the systemic arteries. Clinical observation certainly supported the statement that a sudden increase ot tension in the peripheral arteries might give rise to an attack of angina pectoris. Broadbent pointed out that there were two factors present in an attack of angina—viz., high blood pressure and a degenerate heart muscle incapable of responding to the additional call put upon it, the determining cause being some unusual exertion giving rise to a further increase in pressure. In the past it was more or less assumed that high blood pressure was an invariable concomitant of angina pectoris, but in recent years attention had been directed to the occurrence of typical anginal attacks in the presence of a low blood pressure. It was, however, possible that while the usual blood pressure of the patient was low, the cardiac attack might be accompanied by a rise of pressure; hence the relief which was sometimes experienced in these cases from the inhalation of amyl nitrite. The weak point in his contention that angina pectoris might occur with a low blood pressure was, the speaker admitted, due to the fact that he had not had the opportunity of taking the blood pressure at the time of the attack. He could not, therefore, exclude the occurrence of a high blood pressure. In his experience the victim of angina pectoris had usually a blood pressure considerably above normal, and it was to an intensification of the already high pressure that an anginal attack was commonly due.

On the present occasion he was directing attention to those exceptional cases in which anginal symptoms occurred in patients who had in the intervals a systolic blood pressure about or below normal. He had been much struck by the failure of the drugs usually employed in angina pectoris to give relief in these cases; he was convinced that a fatal termination might be accelerated if vaso-motor dilators were incautiously administered. He thought that the prognosis, which was always a very grave one in angina pectoris, was distinctly worse when anginal symptoms occurred in patients

with a low blood pressure. In other words, the failure of the nitrites to give relief in anginal pain was of bad omen, as it indicated myocardial degeneration and the tendency to death by sudden heart failure. He would insist that all indications of a failing myocardium, such as feebleness of the impulse, a feeble first sound at the apex, low blood pressure, a feeble infrequent pulse, dyspnœic attacks, swelling of the feet, and signs of commencing œdema of the lungs were of very grave prognostic omen; that these cases required a stimulating plan of treatment, and that vaso-dilators were useless, if not dangerous.

Though it was in cases of angina pectoris associated with high blood pressure that the vaso-dilators gave the best results and could be used with the greatest confidence, even in some cases of low blood pressure they might be tried, as they seemed to lighten the burden of the labouring heart. But in these cases vaso-dilators must be given with great caution and not pushed, as an undue lowering of the blood pressure might be attended with disastrous results. It had been suggested that if within a minute or two nitrite of amyl failed to give relief, a whiff of chloroform should be administered. He was doubtful of the wisdom of this procedure, especially in cases of low tension, and would prefer to give morphine subcutaneously. As a general rule angina pectoris, occurring in patients with a low blood pressure, required to be treated on different lines to cases in which the angina was associated with high blood pressure. Nitrites and other drugs promoting vaso-motor relaxation might be worse than useless. An ounce of brandy in hot water might be given, or the following mixture:—

℞ Spiritus ætheris ♏ xx.
Spiritus ammoniæ aromatici ♏ xxx.
Tincturæ cardamomi compositæ ♏ xx.
Aquam camphoræ ad ℥.
Ft. mist.

This might be taken every half hour for three doses if required. In cases of threatened collapse ether ♏ v. or camphor gr. iss. in sterilised olive oil might be injected intramuscularly. In cases in which pain was the chief symptom the only drug of any value was morphine in combination with atropine, which might be given in doses of ¼ to ½ gr. subcutaneously. The application of hot fomentations or a hot-water bag to the præcordium would often give relief. If the feet were cold, hot-water bottles should be applied to them. In the intervals the patient should be carefully dieted, the amount of alcohol should be limited, and tobacco forbidden. Excess in tea or coffee should be checked. Dyspepsia and other conditions of lowered vitality should receive appropriate treatment. Among cardiac tonics no drug was so generally useful as arsenic; it might be combined with iron if the patient were anæmic. The addition of strychnine would help to improve the tone of the patient.

Dr. DE HAVILLAND HALL supported his contention by reports of five cases. He also indicated the necessity for differentiating true angina pectoris from pseudo-anginal attacks occurring in neurotic individuals with a low blood pressure, and described a case illustrating this point. Pseudo-angina was especially met with in excessive smokers. He had seen it occur in patients who had also had abdominal angina.

Discussion

Dr. ALEXANDER BLACKHALL-MORISON said that in classical cases of angina he regarded the left ventricle as being in a state of inhibition. Later, when the ventricle recovered power, any bruit became more audible, the pulmonary second sound became less audible, and the blood pressure rose. In such cases nitrites were of great value, but he doubted whether their action was peripheral, and regarded them as centrally acting stimulants. He queried whether there was any relationship between high blood pressure and angina, often there was no evidence of any ætiological connexion between them. It was not yet known what was the cause of the pain. He was in the habit of administering atropine, since he regarded angina as a variety of vagal inhibition.

Dr. SEYMOUR TAYLOR suggested that angina may sometimes be concerned with the right side of the heart, and there might then be high blood pressure in the pulmonary circulation. He quite agreed that nitrite of amyl should not always be used, and agreed with the treatment advocated by Dr. de Havilland Hall in cases of angina with low blood pressure. He had also seen genuine tincture of musk give great relief.

Mr. RICKARD LLOYD spoke of two cases in which the attacks had been very numerous. In one there had been 55 attacks in three months. At first these were accompanied by high blood pressure, but later by low readings (120–130 mm. Hg) and by Cheyne-Stokes respiration. In his experience, physical and psychical treatment had been more valuable than drugs. Nitrites might do harm, especially if ordered for continuous treatment, in cases where the blood pressure became low between the attacks. The patient should be placed in the position of greatest physical comfort and his attention diverted, and no drug should be administered without good reason.

Reviews and Notices of Books.

Text-book of Embryology. Vol. II: *Vertebrata, with the Exception of Mammalia.* By J. GRAHAM KERR, Regius Professor of Zoology in the University of Glasgow. London: Macmillan and Co., Ltd. 1919. Pp. 591. 31*s.* 6*d.*

THE first volume of this text-book dealt with the Invertebrata, by Professor E. W. MacBride, and was reviewed in THE LANCET, vol. i., 1915, p. 377. This, the second volume, dedicated to the memory of three Cambridge naturalists—Charles Darwin, Francis Balfour, and Adam Sedgwick—gives a sketch in its main outlines of the science of vertebrate embryology as disclosed by the study of the non-mammalian vertebrata—the facts are dealt with as illustrating general principles, and the book itself is not a work of reference as regards details. As the author remarks, the special charm and the chief importance of the study of embryology reside in the fact that it is one of the main branches of evolutionary science. Behind the dull facts of anatomical structure there lies a very charming and living philosophy, which is clearly revealed by the author's exposition. There is not, in fact, a dull or sterile page in the whole treatise. As he points out, the fundamental principles of this philosophy are to be elicited by inquiry into the more archaic types of existing animal life—a subject which the author himself has largely illuminated.

The segmentation, gastrulation, and the formation of the germ layers in each class from the lowest vertebrate to birds are discussed in turn, the origin of the mesoderm being very fully dealt with. Considerable attention is given to the "pineal organ" as it occurs in different animals. Nerve development is fully considered, and the three views—the outgrowth theory of His, the cell-chain theory of Balfour, and the primitive continuity theory of Hensen—are discussed and criticised. The discussion is largely illuminated by the recent knowledge acquired as to the development of peripheral nerve-trunks in lepidosiren. The unrivalled advantage of the olfactory nerve for the investigation of sensory nerves is insisted on and well illustrated. The story of the evolution of the branchial respiratory organs makes interesting reading, especially the discussion on the lungs of birds and the lung of fishes and the evolution of the air-bladder.

A short but intensely suggestive chapter is that on the External Features of the Body, with admirable illustrations. Doubt is cast on the view that the leg type of limb has been evolved out of the fin. The reader is advised to keep an open mind on this dogma, as there exists the possibility that the pentadactyle limb and fin are not in the relation of lineal descent at all, but that they are derived from a common ancestral type of limb differing from either. The author enters very fully into the evidence supporting the external gill hypothesis. This hypothesis fits in well with other facts—e.g., in the breeding male lepidosiren the hind limb regularly, and the pectoral limb occasionally, take contemporarily the characters of any external gill both in structure and in function—a reversion towards an ancestral condition. Equally interesting is the author's account of the evolutionary origin of the tail region.

In the chapter on Adaptation to Environment, the protective envelopes of the egg and the developmental membranes are described, and interesting details are given of the quaint situations selected by some frogs for depositing their eggs; e.g., in the leaves of plants—a kind of nesting, implying attempts on the part of isolated members of a particular group of vertebrates (Anura) to lessen the degree of their dependence upon the ancestral aquatic habit. The

work is brought to a close by a chapter on Some Considerations Relative to the Embryology of the Vertebrata, and one on the practical study of the embryology of the common fowl, in which is described the successive changes day by day during incubation of the egg. An appendix deals with the general methods of embryological research.

We must not close this review without a reference to the illustrations—254 in all—which in their clearness of outline, as well as in their scientific accuracy, reflect the greatest credit upon the artist and publishers alike.

Fractured Femurs: Their Treatment by Calliper Extension. By MAURICE G. PEARSON, O.B.E., M.B., F.R.C.S., B.Sc. Lond.; Brevet Lieutenant-Colonel S.A.M.C.; and J. DRUMMOND, M.D., M.R.C.P. Edin., Captain S.A.M.C. With 51 illustrations. London: Oxford University Press. 1919. Pp. 92. 10*s.* 6*d.*

THIS book is the outcome of a wide practical experience in the treatment of fractured femurs, and should be universally welcomed. It is an extraordinary fact that it is still possible to go round most general civil hospitals and find fractured femurs treated in old-fashioned Liston's splints, or badly applied Hodgen's. Colonel Pearson and Captain Drummond tell us in clear language how to get the best possible results in all cases of fractured femurs. They lay emphasis on several important lessons learnt during the war, especially the necessity of team-work, and of concentrating special cases in special hospitals or wards. For it is only by so doing that results can be compared and progress made. We cannot quite agree that the calliper extension is a simple method of treatment, and one that can be adopted by anybody. In our opinion it is essentially a method that requires more than ordinary skill and knowledge. But there can be no doubt that it is the ideal method, and should be used in every case to which its application is practicable.

The chapters on the surgical anatomy, the mechanics of fractured femurs, and the treatment of special varieties, are particularly good. Rather too much space has been given to the early operative treatment of compound fractures, which are rare in civil practice and in time of war do not demand any very specialised early treatment. The chapter on late treatment is rather short and unsatisfying, especially in its reference to bone-grafting. A really good chapter on the subject of non-union would have greatly enhanced the value of the book.

The illustrations are excellent, and the authors are to be congratulated on the production of a book which so clearly and simply describes what is the best and, indeed, only satisfactory method of treating fracture of the femur.

Le Lait Condensé. Par le Dr. P. LASSABLIÈRE, Chef de Laboratoire à la Faculté de Médecine, Paris. Paris: A. Maloine et Fils. 1919. Pp. 110.

THIS little brochure gives an account of the history, preparation, and composition of condensed milk. This occupies about one-half of the text. The remainder is taken up with a description of the value of condensed milk from a hygienic and physiological point of view. Its clinical and alimentary value in children and adults as well as its therapeutical applications in the gastro-intestinal troubles of infants are discussed; and the diarrhœa of the trenches, dysentery, the diarrhœa of tuberculous adults, and what the author calls "suralimentation lactée" of neuropaths, come under notice.

Sterility in Women. By ARTHUR E. GILES, M.D., B.Sc. Lond., M.R.C.P., F.R.C.S. Edin., Senior Surgeon to the Chelsea Hospital for Women, &c. With 11 illustrations. London: Oxford University Press. 1919. Pp. 227. 10*s.*

IN this little book Dr. Giles has summarised our present knowledge of sterility in women, a subject of much importance, especially, and as the author points out in his preface, at the present time when hundreds of thousands of young men have laid down their lives to save their country. In attempting to determine the percentage of cases in which in sterile marriage the fault lies with the male partner, the author shows how difficult it is to arrive at any certain conclusion, but believes that the husband may be at fault in between 10 to 50 per cent. of the cases. The proportion of sterile marriages in this country he estimates to be in the neighbourhood of 10 per cent. for the working population to some 16 per cent. for the leisured classes.

The causes of sterility are considered under a pathological and clinical classification, and a separate chapter is devoted to functional sterility. The main subject is considered very fully under the headings of Primary Sterility, Congenital and Acquired, and Secondary Sterility. In further chapters the author deals with the diagnosis, the prognosis, and treatment of the various conditions. In an appendix is a general bibliography of the subject arranged in chronological order.

The monograph contains a number of original observations and is a contribution, on which Dr. Giles is to be congratulated, to the literature of an important subject.

An Introduction to the Theory of Statistics. By G. UDNY YULE, C.B.E., M.A., University Lecturer in Statistics, Cambridge. London: Charles Griffin and Co. 1919. Pp. 398. 12*s.* 6*d.*

WE give a cordial welcome to the fifth edition of this work. The first edition was published in 1910, so that it must have a wide circle of readers, although we fear that few doctors have as yet joined that circle. It is extraordinary what erroneous deductions have been drawn from the statistical tables so frequently given in the medical papers. Statistics can be wielded effectively only by those who have taken the trouble to learn how to use them. In order to draw a conclusion about the association of two attributes A and B it is necessary to compare the percentage or the proportion of the B's among the A's with that of the B's among the not A's or a's—i.e., $\frac{(AB)}{(A)} : \frac{(aB)}{(a)}$; yet how often we hear that some disease must be due to syphilis, because 90 per cent. of the cases have had syphilis. Such a statement is not even presumptive evidence that there is any association between the disease and syphilis, unless the percentage of cases among the non-syphilitics in the assemblage considered has been also given. It might be found that an even greater percentage occurs among those who have not contracted syphilis. The first 30 pages of this book will guard the reader against these and other common pitfalls.

The present edition differs from the last mainly in the increased number of references to important papers on the subject, and in the addition of two notes on the law of small chances and on the test of goodness of fit. The chapters on correlation and the theory of sampling are excellent, but they are too technical for any further reference to them in this notice. The author has conscientiously dealt with all the difficulties the student will meet in this perplexing subject.

The Whole Truth about Alcohol. By GEORGE ELIOT FLINT. With an Introduction by Dr. ABRAHAM JACOBI. New York: Macmillan Company. 1919. Pp. 294. $1.50.

Mr. Flint has been studying the propagandist literature of the American prohibitionists, and has been so much shocked by the travesties of fact and argument which he has found in their writings that he has been moved to confound them and to undeceive their dupes by setting out, in the present volume, the whole truth about alcohol. The aim is a laudable one, but it is to be feared that Mr. Flint has not adopted the best method of achieving it. Thus, for instance, having rebuked the teetotaller for his assertion that alcohol is a "poison," Mr. Flint proceeds gravely to announce, as an established "truth" of physiology, that "every particle of sugar taken into the human stomach is changed into alcohol, carbonic acid, and water by the digestive ferments" (p. 85). And again, when confronted with the fact that all the belligerent Governments found it necessary to take measures against alcoholism during the war the author explains that their motive was not to improve efficiency but to increase national pugnacity, inasmuch as alcohol, being a nerve sedative, "agrees better with the comfort of the individual than with the ambitious doings of the Government which intends to use him to promote its cause" (p. 88). It will be seen from these specimens of his methods that Mr. Flint is a believer in the policy of driving out the devil by Beelzebub. Indeed, the whole of his text reads like the caricature of a teetotal handbook.

Mr. Flint has a liveliness of style and a sense of humour that, if used with more restraint, might have been admirably effective on such a subject. It is to be regretted that so good an opportunity should not have been dealt with more successfully.

THE LANCET.

LONDON: SATURDAY, OCTOBER 18, 1919.

The Practice of Preventive Medicine.[1]

A MEMORANDUM has been addressed to the Minister of Health by Sir GEORGE NEWMAN, the Chief Medical Officer to the Ministry, which is entitled, "An Outline of the Practice of Preventive Medicine," and forms an extremely valuable piece of contemporary social history. The outline is at the same time so large in scope and in so many directions elaborated in detail that no attempt to epitomise its contents can possibly be successful. Fortunately there is no necessity to make any such attempt, for the book is published by His Majesty's Stationery Office at the price of 6*d*., and it should be, in our opinion, immediately purchased and read, not only by all of us, but also by that larger public who take an administrative as well as a theoretical interest in the progress of national health.

The text of the Memorandum is found at the right place, in the opening sentences, which run: "The first duty of medicine is not to cure disease, but to prevent it. In its simplest terms, therefore, the purpose of the science and art of Preventive Medicine is to apply human knowledge to the prevention of disease." And the author proceeds to discuss how preventive medicine may develop and fortify the physique of the individual and increase his powers of resistance and those of the community; how it may prevent or remove the causes, conditions, and propagation of disease; and how it may prolong the span of man's life. The questions are attacked in an orderly manner, under the subheadings: eugenics, the protection of the function of motherhood and of the health and physique of the infant, school child, and adolescent; personal and domestic sanitation; industrial hygiene; and prevention and treatment of infectious and non-infectious disease. But the broad view of the Memorandum is expressed when the author points out that these subjects, though placed in ordered sequence, overlap and overflow each other. The interrelation of the circumstances accordingly makes it necessary that the preventive methods should be carried out on terms of mutual understanding between the different actors, and it is obvious that the link between the various expert and special services of medicine must always remain the general practitioner. "The foundation," says Sir GEORGE NEWMAN, thoroughly recognising the position, "of a medical service is the medical practitioner. He is its pivot, its anchor, its instrument. If he is competent it has the first surety of success; if he is ineffective or ill-equipped, it must fail. His competency is not only his learning and knowledge, but his practical capacity, his clinical skill and experience, above all his resourcefulness, adaptability, common sense, tact and imagination, firmly established and set in integrity and high character. These are individual virtues, and the medical practitioner is individualistic in upbringing and in genius." That is so, and accordingly what is the prime necessity for the medical practitioner if his qualities are to be placed to their best advantage at the service of the public? The public coöperation—that general sympathy of the population to which he administers, which will allow proper play for his necessary individualism, while recognising that his mission is the most general and generous one on earth. The Memorandum, therefore, rightly takes note of the necessity for the education of the people in hygiene, as well as of the endless call that there is for research, inquiry, investigation—for the extension, in short, of the boundaries of knowledge in all directions ancillary to medicine. The general practitioner, almost more directly than the specialised workers, needs, on the threshhold of a new sanitary era, the good will and the practical assistance of the public, from whom first-hand information concerning the sanitary needs of the population can be obtained and many of whom can assist in providing the right methods to meet these needs. That such a union of forces has not prevailed more in the past has been due somewhat to the ultra-professional attitude of the less progressive of our calling, but mainly to the unfamiliarity of the public with the alphabet of hygiene or the purport of scientific research. With the general practitioner recognised as the foundation of all medical service, placed in proper relation to the various specialist branches of his calling, and supported in his work by the practical help of a public which understands his ideals, an adequate medical service will certainly be obtained.

The first meeting of the Medical Advisory Committee of the Ministry of Health will be held this week, and it is understood that among the principal subjects to come up for early discussion at these meetings will be the reorganisation of panel practice, which cannot at the present time be said to be in a satisfactory condition. Panel practice represents to a very large extent the care of the health of the people which can be rendered by the general practitioner, and in its working he is at grips with the essential problems of preventive medicine, while ministering to the immediate needs of his charges. The conditions of such work should be freed from uncertainties as to the date and rate of payments, and above all from the temptation to accept too heavy responsibility as the obvious method of increasing remuneration. Additions to the income of the medical practitioner may well be expected to accrue from duties discharged as part of the State organisation of a national medical service, when preventive and curative medicine are brought together and practised in harmony.

[1] An Outline of the Practice of Preventive Medicine: A Memorandum by Sir George Newman, K.C.B., M.D., D.C.L., F.R.C.S. London: 1919. His Majesty's Stationery Office. 6*d*. net.

The Topographical Distribution of Serological Differences.

AMONG the many exceptional opportunities for scientific research afforded by the war must be counted the remarkable assembly of different races in certain of the areas of war. The most motley collection of all was to be found in Macedonia, with its centre at the Salonika base, and the opportunity here was taken by Dr. LUDWIK HIRSCHFELD and Dr. HANKA HIRSCHFELD, whose paper appears in our present issue, for carrying out a very interesting and suggestive research upon certain serological characteristics of the various races. The "iso-agglutination" of the red cells of one individual by the blood serum of another, a property hitherto investigated mainly in connexion with the theory of immunity or with an eye to the practical aspect of blood transfusion, has been applied by these workers to the study of the biochemical characters of the blood of human races, and hence of racial origins and affinities. Accepting "Landsteiner's Law" that there exist two agglutinable substances ("properties" is the less committal term used by the translator) in human blood, and that an individual may possess one, both, or neither of these; and, moreover, that there are two varieties of agglutinin in human serum, each of which can only react with its corresponding member of the pair of agglutinable substances; and that an agglutinin is only present when the corresponding agglutinable substance is absent, and vice versa,—the authors have drawn some interesting general conclusions from their extensive series of observations. They find that the two properties (A and B) are present with variable frequency in the bloods of different races, and that these frequencies present a regular gradation from the peoples of North-Western Europe, through those of the south-easterly parts of the continent, down to the races of Asia and Africa. English and French appear at one end of the list, with a preponderance of property A, and the Annamese and Indians, with a preponderance of B, bring up the opposite end. The order of the list appears to agree with a topographical rather than an ethnological principle. The two properties are independent of one another, and are inherited in accordance with Mendelian theory. On the basis of these results an hypothesis of a double origin of the human race is tentatively propounded.

It is impossible to deny the great value and significance of this line of inquiry, or to disagree with the author's recommendation of more extended research upon these and similar lines. But in this connexion a few observations upon the dominant place of technique in scientific research will not be out of place. It must be admitted that serology is still in its perambulator, though there are many indications that its growth into a rational science will be rapid. Hitherto the methods employed have been largely qualitative and of a rough-and-ready order, and though these have served well for the discovery of the main basic facts, yet it is only by the use of thorough quantitative methods by researchers trained to a truly scientific outlook that rapid and sure progress in the future can be secured. Only thus will it be possible for the infant science to escape from the jungle of imperfect or erroneous observations which make it so hard to see the lamp of Truth. Without casting any doubt upon the general validity of the work of the Drs. HIRSCHFELD, we feel that they have hardly given due attention to this all-important question of technique. It is dismissed in their paper in a few lines, and they appear to reck little of the serious errors into which most experienced workers on agglutination know that it is easy to fall unless the utmost precision in measurement, time, temperature, and other technical factors be practised. It is a truism that a relatively small number of highly organised observations will yield a greater measure of truth than a much larger number of lightly undertaken experiments. To multiply imperfect experiments is to multiply errors. It follows that a very thorough study of all the factors that influence the agglutination of human red cells by human sera is a highly desirable preliminary to any further extension of such researches as those under discussion. For magnificent mansions are dangerous if there be even a single sandy patch in the foundations.

The Aerial Combatant.

THE informative articles by the late Captain H. G. F. SPURRELL, R.A.M.C., on the psychology and nervous physiology of the aerial combatant, published in THE LANCET of Sept. 27th and Oct. 4th, have a bearing on wider problems than those of the flying fighter, or, rather, raise questions on the inter-relation of conscious and subconscious activity of which the flying man supplies but one, though perhaps the most notable, instance. It is a matter of everyday experience that for volition to interfere deliberately in an automatic performance is to court disaster. A pianist who has learned a composition by rote will play it perfectly as he simultaneously conducts a conversation with the youthful admirer by his side, but any attempt to read it from the music in front of him is fatal since visual impressions and kinæsthetic memories may come into conflict; the less skilled amateur who has laboriously learned a simple piece may not even be able to begin it volitionally anywhere but at the commencement. There used to be an old guide at St. Andrews Castle who showed the recesses of the famous bottle dungeon to the accompaniment of a long historical rigmarole, interruption of which by an indiscreet question on the part of the visitor invariably led to its reiteration from the beginning.

In the acquisition of any motor-complex volition, as Captain SPURRELL says, takes a pro-

gressively diminishing part and, finally, the performance is automatic and not merely requires no thought but does not interrupt thought. It is always a question, however, whether the elimination of volition is as complete as is usually supposed, and whether the "instinctive" response to a stimulus bearing on the acquired motor-complex does not rather consist in a volitional act characterised by an increasingly short reaction-time. We know that much more elaborate reflexes can be elicited under pathological conditions from the mesencephalon and spinal cord than was formerly understood; that the isolated spinal cord, indeed, can be made to respond to suitable stimuli by the production of automatic walking movements; that the "decerebrate" human organism (as seen, relatively speaking, in some microcephalics, diplegics, hydrocephalics, and in other states with diminished cortical control) can be shown to possess complex motor mechanisms whose activity is none the less purposeful because non-cortical. But the movements requisite for correct flying are obviously characterised by much greater elaborateness and delicacy than any of the reflex mechanisms just specified, and for their initiation, at least, demand the highest type of cortical supervision. Whether, therefore, they can at a later stage be delegated to lower centres is debateable. The successful execution of a pianoforte composition entails no attention to extrinsic stimuli; it implies nothing more than the ordered repetition of a series of similar movements based on the awakening of a store of kinæsthetic images, which can be done most easily, as a fact, when the performer's attention is not specially concentrated on it. Though automatic, however, it is surely none the less cortical. But the act of flying entails continuous response to a whole group of changing extrinsic stimuli via several sensory avenues, and Captain SPURRELL himself admits that "general orders from the presiding intelligence" are necessary.

The truth probably lies in recognition of the fact that some reactions to stimuli are so frequent as to become inevitable, with a minimum reaction-time and a minimum of conscious interference, and that the trained cortex acts so nimbly, so quickly, that the accomplished flyer can attend to other matters with confidence that his "automatic" self will not fail him. It is as though the cortex were a physiological mosaic illuminated by the stream of conscious attention playing on one pattern, while others are not so strongly in the light; but mere consideration of the extraordinary anatomical complexity of the cortex as compared with the relative simplicity of structure of the true "lower motor centres" entails hesitation in ascribing to any other part than the cerebral hemispheres the faculty of delicate response to multiple and perhaps conflicting stimuli. The scratch-reflex of the spinal dog is a four-per-second automatism unmodifiable by alteration of cutaneous stimulus and crude in comparison with the responses of the flying fighter to the calls of flying, fighting, and observing. It might be suggested, therefore, that many acquired automatisms of a highly complicated nature are cortical groupings trained to all but independent activity, and that attention rather than volition may on occasion act as a disturbing element in their execution.

Annotations.

"Ne quid nimis."

PHYSIOLOGICAL DRINK CONTROL.

THE Society for the Study of Inebriety gave its members and associates a strenuous day last Tuesday, when the autumn conference in London opened with a reception and breakfast at 8.30 A.M., given by the National Temperance League, and closed with the delivery of the Norman Kerr lecture at 5.30 P.M. by Mrs. Scharlieb. The lecture was entitled "The Relation of Alcohol and Alcoholism to Maternity and Child Welfare," but this did not prevent the lecturer from covering the whole question of alcoholism in its relation to social problems. At the morning session Lord D'Abernon introduced a discussion on the Scientific Basis of Drink Control, and in the afternoon Sir Thomas Whittaker dealt with Alcohol in Relation to Recreation and Refreshment. It is quite evident that a great impression has been made on all those interested in orderliness and sobriety, whatever their particular doctrines, by the clear results which accompanied the measures elaborated in 1915 by the Central Control Board of Liquor Traffic and the restrictions imposed by the Food Controller which followed hard upon them. Many are now coming to realise that, as Mrs. Scharlieb puts it, to insist on universal abstinence is to lose the desired result by the deification of the means. The measures of the Board were based primarily on general physiological principles, although at first no trustworthy data were available in regard to the precise effects of these principles. The omission has now been made good partially by the work of Dr. H. M. Vernon, Dr. E. Mellanby, Dr. W. McDougall, Miss May Smith, and others, and Lord D'Abernon has a substantial basis both of experiment and experience in insisting upon the governing principles of physiological control as dilution, including the specially important sort of dilution effected by food, and discontinuity in the hours of drinking. With dilute solutions the maximum level of alcohol in the blood is lower and more slowly reached than is the case when the drug is taken in more concentrated form, and there is recent evidence for the belief that the same amount of alcohol is decidedly less intoxicating when taken in the form of beer than when taken in the form of spirits. Physiological regulation aims at promoting temperance by qualitative rather than quantitative methods. There is some little doubt as to the relative share taken by the Food Controller and the Liquor Control Board in the results achieved during the war, especially as it has been alleged that the effects were as manifest in those parts of the country which were controlled by the former alone as in those where both factors came into play. But if we agree with Mrs. Scharlieb that during the past four years there has been no real change in the national conscience, it may be well, without inquiring too closely into their relative value, to continue with the qualitative methods, which are still open to us in normal times, when the quantitative methods, tolerated during a grave period of external emergency, can no longer be put in practice without too drastic an interference with personal taste and established custom. *How* the nation drinks may, in Lord D'Abernon's phrase, prove more significant than *how much* the nation drinks.

URINARY HÆMOLYSIS.

Professor Alfredo Amati, of the University of Naples, has lately published a brochure[1] with the object of clearing up the fragmentary and often contradictory contributions hitherto available on a subject which he considers may prove of extreme practical importance. The questions which he set himself to answer are as follows: (1) the behaviour of red blood corpuscles when immersed in the urine of healthy persons and what influence was exercised by the specific gravity, reaction, amount of chlorides and urea, and the molecular concentration; (2) whether the hæmolytic power of pathological urine depended on any of these factors. These researches giving negative results, he investigated the relation between hæmolytic urine and blood serum and between hæmolytic serum and the urine. Having found that the urine of patients was sometimes hæmolytic and at other times not so, he instituted a series of experiments to determine what degree of dilution with distilled water was necessary in a healthy subject's urine to produce hæmolysis, and finding that the relation was the same for all healthy urines he investigated the same relation in the hæmolytic urine of nephritic and cancerous patients. The more important results he deduced from his experiments were that physiological urines are not hæmolytic whatever may be the specific gravity, saline content, quantity of urea, and cryoscopic reaction; they have, however, a hypertonic action on the corpuscles, causing them to appear shrunken under the microscope. This hypertonic action is more manifest with urines of high specific gravity, while those of low specific gravity, and therefore poor in chlorides, do not cause this shrinking of the corpuscles, which preserve their normal appearance, even when the quantities of chlorides and salts are in amounts so low as to render the urine hypotonic in comparison with blood serum. In some pathological conditions, especially in renal disease and malignant tumours, the urine may become hæmolytic. The hæmolytic power in this case also is independent of specific gravity, quantity of chlorides and salts, and cryoscopic reaction. The hæmolytic power of the urine is, in the majority of cases, independent of the hæmolytic power of the blood serum—i.e., a hæmolytic serum does not give rise to a hæmolytic urine, and vice versa; thus, while a nephritic urine may be hæmolytic while the serum is not, the possibility of a lysine of renal development must be considered. The substances which give the hæmolytic power to urine are probably different from the hæmolysins of the Ehrlich and Bordet type. Physiological urines from healthy individuals, whatever their specific gravity, reaction, &c., require a marked dilution with distilled water to become hæmolytic, which usually amounts to five-sixths water to one-sixth urine. An important point is that this degree of dilution is almost constant in all urines; it requires a urine of very low specific gravity, and hence very deficient in salts, to displace this index of dilution to two-thirds and one-third, and, vice versa, urines rich in solids, in order to produce hæmolysis, require a dilution of one-half urine to five and a half water. In no instance can hæmolysis be obtained with physiological urines with a dilution less than two parts urine and four parts water, nor more than one-half urine to five and a half parts water. If the least indispensable dilution is called the *uro-hæmolytic coefficient*, this coefficient is almost constant in physiological urines—it is usually equivalent to five-sixths, but may oscillate between two-thirds and ten-elevenths. In pathological urines, on the other hand, using the same system of dilution in patients suffering from nephritis or malignant tumours, the uro-hæmolytic coefficient is considerably displaced, so that it becomes inverted and reaches the figures of one-eleventh to one-third. It is seen, therefore, that while the urine in these diseases is rarely and not constantly hæmolytic, it always presents an alteration in the uro-hæmolytic coefficient, and it may be confidently stated as an axiom that physiological urines have an almost constant uro-hæmolytic coefficient, whereas those of nephritis and malignant tumours, although not in themselves hæmolytic, have this coefficient markedly and invariably altered.

[1] G. Borrelli and Son, Via Tribunali, Naples, 1919.

DENTAL CARIES IN THE PRE-SCHOOL CHILD.

A PAPER by C. Doswell Wallis in the *Dental Record* for September, on the work of the Infant Welfare Centres of the Duchess of Norfolk, contains some interesting statistics on the condition of the teeth of children under school age. Inspections were carried out at two centres, the teeth being classified into sound, saveable, and unsaveable. Seventy-five children were examined, and in these were 1208 teeth classed as sound, 107 as saveable, 95 as unsaveable. The figures are most instructive and show that there is a large amount of caries at the age-period 4 to 5 years, for in 15 children there were 101 diseased teeth, and of these 54 were unsaveable. Unfortunately, the records do not state the individual teeth attacked, but as clinical experience shows that the molars are more liable to disease than the incisors, it is fair to assume that about half the molars were carious. In dealing with dental diseases in the young, the tendency is to concentrate on those of school age, but we have pointed out before in these columns that treatment must start at an earlier period if the best results are to be obtained, for by the time the child reaches school age there is often irretrievable damage—a fact eloquently demonstrated in the figures given by Mr. Wallis.

INCREASE OF PAYMENT OF PENSIONS BOARDS.

WE understand that the Minister of Pensions has given further consideration to the question, raised by a deputation from the British Medical Association, of the remuneration of members of the boards. It is stated that the Ministry fully appreciates the services rendered by the medical profession, both during and since the war, in serving on these boards at some personal sacrifice, as this duty involves frequent absence from the work of their private practice. The Minister agrees that the present fee of one guinea per session for ordinary members of boards is inadequate since the emergency arising from the war has disappeared, and has obtained authority to raise the fee to £1 11*s.* 6*d.* per session after Oct. 6th. The additional fee payable to a doctor acting as chairman of a Board has also been raised to 5*s.* 3*d.* per session, or 10*s.* 6*d.* per day, but there is to be no increase in the fees payable to specialists. The intentions of the Ministry as to duration of session and its policy in regard to the appointment of medical referees is as indicated in THE LANCET of Sept. 13th, p. 498. The deputation had also directed the Minister's attention to

complaints of delay in settling accounts of fees due for service on medical boards. It is stated, in reply, that every effort is made to secure prompt payment and that the Minister believes that in general these claims are expeditiously settled. He is willing, however, to make special inquiry into any individual case brought to his notice in which delay is alleged and to take steps to secure its immediate settlement.

PREGNANCY AND INFLUENZA.

THE fatality of influenza among young married women was a matter of common remark in the second wave of the great epidemic in this country. Figures are now available bearing on the subject in Paris. In his thesis on influenza complicated by pregnancy Malartic (*Thèses de Paris*, 1918–19, No. 286) states that the mortality during the recent epidemic among pregnant women at the Paris Maternité Hospital was 46 per cent. Pulmonary complications were extremely frequent, being observed in 73 per cent., and the mortality among cases with these complications was 58·4 per cent. as compared with a recovery rate of 95 per cent. among women in whom the lungs were not affected. Premature delivery, which occurred in 17 per cent. of the cases with pulmonary complications, proved fatal in six out of 11 cases, or about 50 per cent.; miscarriage, which occurred at an earlier stage of pregnancy in 6 per cent. of the cases with pulmonary complications, proved fatal in three out of four cases, or 75 per cent. "Woe unto them that are with child," might have been written of this influenza epidemic.

CHIP FRACTURES OF THE TERMINAL PHALANGES.

IN the *Journal of Industrial Hygiene*, a new Anglo-American periodical which we have recently welcomed,[1] Dr. W. R. Hurley, chief surgeon at Fore River Plant, Bethlehem Corporation, has described a fracture of the terminal phalanges which does not appear to be recognised in this country, and in his experience is frequently overlooked even by the "industrial surgeon." This is due to absence of signs of fracture. As a rule the history is of slight injury, and simple contusion is diagnosed. In a series of 27 cases, 10 were due to getting a finger caught between two small pieces of steel, and 3 to it being jammed in the door of an elevator. In practically all the cases the signs were slight, usually consisting of a little hæmorrhage under the finger-nail and some tenderness and swelling. The importance of the injury is due to the length of the resulting disability. In 17 cases this averaged 60 days. This period is the more impressive when it is remembered that rarely does a transverse fracture of a phalanx cause more than five weeks' disability, and, when apposition is good, the period may be much less. The long disability is due to persistent tenderness and infection. The infection is not connected with any wound which may be present at the time of the injury. As a matter of fact, infection occurs as frequently in cases without wounds as with wounds. Kanavel has shown that the diaphyses of the terminal phalanges receive their blood-supply after the artery enters the connective tissue of the pads of the finger-tips. Moorhead has suggested that this fact explains the frequent affection of bone in neglected or improperly treated cases of inflammatory conditions of the finger-tip. Similarly, Dr. Hurley suggests that in chip fracture the blood-supply is cut off partially, and the chip, which is often well separated from the rest of the bone, does not obtain nourishment, and acts as a foreign body. The surrounding tissues break down and a low grade of infection occurs. The second cause of lost time, persistent tenderness, is probably due to non-union of the fracture, the movement of the fragment causing pain. The following is an example. A man, aged 21 years, was injured by a swinging chain striking the middle finger. On June 28th, 1918, examination showed a slight abrasion. The finger-tip was much swollen. There was no crepitus or deformity, but some limitation of movement in the distal joint was noticeable. The X rays showed a chip fracture. Hot fomentations, an alcohol dressing, and a splint were applied. Excepting the persistent tenderness there was nothing to note until July 17th, when the tenderness became more severe and throbbing pain was felt. Meanwhile the abrasion had healed. Suppuration took place under the nail, which was removed. On the 26th the X rays showed thinning of the phalanx, which was amputated. Convalescence was slow in consequence of a slight ascending infection. The patient did not return to work until Jan. 10th, 1919. In a later case it was found that the period of disability was much reduced by removing the chip. Dr. Hurley recommends the following routine. All contusions of the fingers and toes, especially those accompanied by swelling, should be examined with the X rays. The treatment at first should be expectant. If after the first few days the swelling or tenderness increases, or if there is persistent tenderness after the fourth week, the chip should be removed. The sooner the chip is removed after the fourth week the better the chance of healing by first intention.

[1] THE LANCET, Sept. 27th, p. 587.

THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

WE are glad to announce that the Museum of the Royal College of Surgeons of England is now itself again. During the war its staff and its chief rooms were placed by the Council of the College at the disposal of the War Office for the purpose of building up and exhibiting a national collection of specimens to represent the nature and sequelæ of wounds and of diseases to which soldiers are exposed under modern conditions of warfare. Until the future destination of this "National" or "Imperial" Collection is finally determined on, the Council of the College has set aside one of the larger rooms of the Museum for the public exhibition of the collection. The other rooms have had their former contents restored to them, for during the greater period of the war it was found necessary to store all spirit specimens in the vaults of the College. The restoration of the contents to the Museum provided an opportunity for effecting certain desirable changes in the arrangement and display of specimens. The largest room in the Museum is now entirely devoted to the exhibition of pathological specimens, the series illustrating general pathology—the most complete of its kind now in existence—occupying the floor space of this room or hall. Medical men and students will now find every section available for study.

Museum Demonstrations.—A series of demonstrations is to be given by Professor Arthur Keith at the College of specimens illustrating

the various forms of disordered growth which follow disease or functional derangement of the glands of internal secretion. The first of the series will be given in the Theatre of the College, Lincoln's Inn-fields, on Friday next, Oct. 24th, at 5 P.M., when specimens showing the bodily changes in acromegaly will be demonstrated. The subsequent demonstrations will be duly noted in our Medical Diary for the week. The demonstrations are open to all medical men and students of medicine.

TREATMENT OF SEA-SICKNESS.

Major A. E. Lemon,[1] of the United States Army, remarks that it has long been believed that sea-sickness is the result of the motion of the ship affecting the semi-circular canals, the organ of equilibrium in the internal ear. In a voyage from Brest to New York in which the ship, although she pitched and rolled very little, had a very pronounced plunging motion, he unexpectedly became very sea-sick. Feeling an indefinite sense of change of pressure on the ear drums he packed each external meatus with sterile gauze, with immediate relief as soon as the gauze had been packed tightly enough to cause a decided sense of pressure in the ear canal. In the course of inquiry from a large number of sea-sick soldiers on board whom he was able to treat successfully by this method he learnt that those who had been exposed to shell-fire were almost without exception much more affected with sea-sickness on their return journey than on their voyage to Europe. Major Lemon himself, who had previously been a good sailor, attributes his own severe attack to the fact that his ear drums had been injured by shells exploding within a few yards of him. Many of the cases in whom the symptoms had been arrested for several hours had a return of their sea-sickness as soon as the packing was removed, but were again relieved when it was reinserted. This is a resuscitation of an old theory, and we doubt if experience will confirm its value.

THE CAUSE OF DEATH IN DIFFERENT COMMUNITIES.

No medical officer of health has the right to complain that his views on his work and on the health of the community under his charge are pressed into a stereotyped mould. The reports of the county and borough medical officers which we receive at intervals during the year are of all shapes, sizes, and colours as regards their exterior, while their contents are equally various; so much so that it is by no means easy to find a common message in any of them. We have reduced certain figures taken from two recent reports to a common basis, as they illustrate in rather a striking manner the thoughts expressed by Dr. E. S. Reynolds in an interesting Bradshaw lecture, published in our columns two years ago, on the causes of disease. Dr. Reynolds pictures a community of 1000 healthy men and 1000 healthy women segregated on a healthy island for the remainder of their lives, and he endeavours to imagine from what diseases they and their descendants would suffer and from what they would die. The conditions are obviously never likely to be fulfilled, but the returns for 1918 from the Island of Guernsey and from the City of Liverpool bid fair to afford the greatest available contrast. No island in the British archipelago was ever more cut off and no British city ever more congested than Guernsey and Liverpool under war conditions. The most frequent conditions giving rise to death during the year 1918, stated per 1000 of population estimated at mid-year, are as follows:—

Principal Causes of Death during 1918: Figures given per 1000 of Population estimated at Mid-year.

CITY OF LIVERPOOL.		ISLAND OF GUERNSEY.	
Pneumonia	1·84	Influenza	2·47
Bronchitis	1·80	Senile decay	1·82
Phthisis	1·79	Heart disease	1·61
Influenza	1·78	Phthisis	1·27
Broncho-pneumonia	1·50	Pneumonia	1·17
Heart disease	1·10	Cancer	1·14
Cancer	0·97	Apoplexy	1·01
Congenital debility	0·84	Tuberculosis (other than phthisis)	0·31
Senile decay	0·77	Broncho-pneumonia	0·23
Diarrhœa and enteritis	0·55	Epidemic enteritis	0·08
Cerebral hæmorrhage	0·54	Measles	0·00
Measles	0·52		

In regard to microbial infections it may be noted at once that broncho-pneumonia, epidemic enteritis, and measles occupy an insignificant position as deadly diseases in the island community. In the urban community they slay widely. One scourge, influenza, spares neither; it was, in fact, more rife in Guernsey than in Liverpool. Phthisis is not greatly behind on the island, and this incidence illustrates once more the fact that the tubercle bacillus cannot be dealt with on the lines of other bacterial agents. It is noteworthy that in the island community so large a number as 1·82 per thousand should live long enough to die of senile decay, while apoplexy, another disease of age, has twice the urban incidence. The town-dweller's risks are other than these. Further deductions might be drawn; our remarks are based on a hasty survey of the figures.

THE MIDWIFE'S CHARTER.

NOT long ago the Ministry of Health and the Board of Education simultaneously issued documents ostensibly defining the conditions under which public money was to be used in the training of health visitors, but really in effect drawing up a magna charta of infant welfare. The same bodies have now issued[1] a smaller charter relating to the midwife. Grants-in-aid have for several years been available to assist a local sanitary authority to obtain the services of a midwife in any area where they were urgently needed. And the Board of Education now offers substantial grants for the training of midwives. We say advisedly a smaller charter—the Ministry of Health may justify its size as proportional to the unborn child—yet all who have the best interests of the midwife at heart will regret the attitude taken up in the memorandum, that any sort of entrance examination is impracticable for the career of the midwife. The Board only goes so far as to express the pious hope that students admitted should be likely, from character and previous education, to profit by the training and instruction given. Every student who accepts the grant has to sign an agreement or declaration of "bona fide" intention to practise as a midwife. This, by the way, reintroduces the term "bona fide" in connexion with midwives in a new and less ominous sense. The declaration will disqualify from obtaining the grant the hundreds of women who annually take the C.M.B. certificate as an added diploma to general

[1] Journal of the American Medical Association, 1919, lxxiii, 104.

[1] Board of Education. Draft Regulations for the Training of Midwives. Prefatory Memorandum. [Cmd. 353.] Price 1d.—Ministry of Health. Circular to Supervising Authorities under the Midwives Acts. No. 10.

or maternity nursing and without any intention of practising as midwives. In rural areas it may be impossible in the nature of the things for the midwife to devote her whole time to this work, and an exception is admitted in this respect. The grant payable will be at a rate not exceeding £10 for each student, who completes the approved course of the Central Midwives Board, a further grant of £6 being available for further work at institutions giving post-praduate instruction. So for the first time justice is being done to the Cinderella of the Public Health Service.

RICKETS AND THE MANDIBLE.

THE effect of rickets on the jaws forms the theme of a thoughtful paper by Dr. H. K. Hatfield, of Boston, in *Dental Items of Interest* for September. The material for study was obtained from the Massachusetts Hospital School for Crippled Children, the cases selected for investigation being those in which there was a clear diagnosis of the disease. Fifteen children were examined and plaster models of the mouths were taken, and these were reproduced in the illustrations accompanying the paper. A theory has been held that rickets tends to produce malformation of the jaws, but a careful study of these cases gave no support whatever to this view; indeed, several of the children were possessed of remarkably well-formed arches. Softening of the bones is a characteristic of the disease, but the form which the bone takes on as the result of rickets is not typical of the disease, but rather expresses the mechanical forces acting upon it. "The mandible," he says, "is a plastic structure in health and under the stress of mastication preserves its form; hence in softening of the bone and with uniform muscular weakness, no change in the bone necessarily occurs." On the other hand, the introduction of an artificial force or a change in muscular action will alter the equilibrium determined by function and produce deformity; this is well seen in the effect of mouth-breathing and the use of the "dummy" in children suffering from rickets.

Sir Berkeley Moynihan will open the session of the Harveian Society of London on Thursday, Oct. 23rd, at 8.45 P.M., with an address on the Diagnosis and Treatment of Gastric Ulcer. All members of the medical profession are invited to attend.

THE PROFITEERING ACT, 1919.—The proceedings for complaints against wholesalers under the Profiteering Act, 1919, are simple of comprehension. The whole of the machinery contemplated by the Act for the investigation of costs or profits, the investigation into the operations of trusts and combines, and the hearing of complaints of profiteering made against both wholesalers and retailers is now in being. Retailers who consider that a wholesaler is making or seeking an excessive charge in respect of any article in common use to which the Act applies should bring the facts to the notice of the Secretary to the Complaints Committee, Profiteering Act Department, 54, Victoria-street, London, S.W.1. There is no official form on which complaints have to be made. All that is necessary is that the facts should be put in writing and delivered to the Committee within seven days of the date of the transaction in question. The following information should be given: (1) Date of transaction; (2) the conditions under which it was entered into; (3) the names and addresses of the parties; (4) the precise nature of the goods; (5) the price paid or demanded. If the Committee considers that the facts supplied disclose a prima facie case of profiteering they will appoint a tribunal to hear the case. A complainant must be prepared to attend before such a tribunal and give evidence on oath; he may conduct his own case or appoint some other person for the purpose.

CONTROL OF VENEREAL DISEASES.

THE VENEREAL PREVENTION COMMITTEE.

A COMMITTEE has been formed with the view of impressing on the public the great importance of immediate disinfection in the prevention of venereal contamination. In a communication to the press it is stated that the committee cannot accept the conclusions in regard to the "packet" system arrived at by Major Astor's Inter-Departmental Committee or by the National Council for Combating Venereal Disease, whose policy "appears to be based on moral rather than medical considerations." The communication proceeds:—

"In view of the White Paper recently presented to the Ministry of Health containing the decision that the official recognition of self-disinfection in civilian venereal disease is 'neither desirable or practicable,' we think it urgently necessary, in the interests of the national and racial health, to ask our fellow-citizens for the action which the official forces of the nation find themselves unable and unwilling to take.

"There are evidently only three possible courses: (1) To take no action against venereal infection, apart from moral teaching; (2) *delayed* disinfection (early treatment centres); (3) to teach and provide *immediate* self-disinfection. We all agree in rejecting the first course. The White Paper recommends the second; but the provision of centres for delayed disinfection is not, and never can be, adequate. The London County Council, the greatest urban authority in the country, has rejected the scheme. No method is even suggested that could be worked in rural districts. The practical difficulties in town and country alike are insuperable. Time, the vital factor, is necessarily lost in every case.

"There remains only the third course—namely, immediate self-disinfection. We maintain that venereal disease is thus preventable, that authoritative teaching on the subject is urgently required, and that the means, together with approved instructions for their use, should be readily accessible to the public. We fail to recognise any moral distinction between the provision of delayed disinfection at centres, and the provision of immediate self-disinfection, and we decline the grave moral responsibility of attempting to conceal the knowledge which is capable of saving myriads of the innocent, living and unborn, from the most hideous disease of body and mind."

The signatories to this communication have provisionally formed themselves into a Venereal Prevention Committee, to whom inquiries may be sent at 143, Harley-street, London, W.1. The names are as follows: Lord Willoughby de Broke (chairman), Principal J. G. Adami, Mr. G. L. Cheatle, Sir Bryan Donkin, Sir Alfred Fripp, Sir W. Arbuthnot Lane, Dr. R. Murray Leslie, Professor Harvey Littlejohn, Dr. R. A. Lyster, Sir John Macalister, Sir James Mackenzie, Dr. Otto May, Sir Frederick Mott, Sir William Osler, Dr. William Pasteur, Sir D'Arcy Power, Sir Archdall Reid, Sir Humphry Rolleston, Dr. C. W. Saleeby, Dr. J. H. Sequeira, Dr. David Watson, Dr. R. M. Wilson, with Mr. H. Wansey Bayly (honorary secretary).

The Two Parties and their Tenets.

The formation of such a committee is to be welcomed, especially if it applies itself in a scientific and judicial manner to the task which awaits it. For a long time past thoughtful minds both within and without the medical profession have been exercised as to what form of protective procedure should be advocated with regard to those persons exposing themselves to the risk of venereal infection. The resultant controversy has been marked by intensity rather than by a really judicial spirit. Speaking broadly, the majority of the combatants have ranged themselves into two camps. The one is composed of those who believe (for various reasons) that the solution of the difficulty is to be found in the advocacy of "early treatment" or "delayed disinfection," to be carried out at "early treatment centres" or elsewhere; the other side is represented by the advocates of "prophylaxis," or "immediate self-disinfection," to be carried out at the time of exposure to risk.

Such being the two main parties engaged in the controversy, it must be admitted that up to the present there has been an insufficiency of definite and convincing information advanced by either side. Owing to the absence

of sufficient data, qualitative and quantitative, it is at present premature to initiate any extensive organisation to promulgate or carry out the tenets of either party. We believe that it is possible for the necessary data to be obtained, and are only temporarily agnostic in Huxley's sense of the word. The new committee should help to crystallise a problem which has hitherto been presented in too nebulous a form, and we look to it and to its fellow protagonist, the National Council for Combating Venereal Disease, to educe and substantiate in a definite and scientific manner the reasons for the faith which they respectively hold.

Some Insufficiently Recognised Considerations.

There are certain cogent aspects which have not received the consideration which they merit.

(1) Those who condemn the prophylactic treatment on ethical grounds argue that persons who are restrained by fear from indulging in venery may, by the removal of their fear, be tempted to immorality, for which the advocates of prophylaxis should be held responsible. Putting to one side the fact that fear does not connote any ethical or religious quality, and on the other hand that the majority of individuals are not restrained by fear, the moral and physical outcome of condemning the policy of auto-prophylaxis must be boldly faced. It is certain that many individuals (who are not restrained by fear) will take risks, and in ignorance of prophylactic measures thereby contract disease. This they will pass on to others, particularly women and children. If it can be proven that in all probability the adoption of prophylactic measures would have prevented the primary agent from contracting and handing on the disease, then the advocates of the non-adoption of prophylactic measures will be ethically responsible for the suffering entailed. In other words, in order to bolster up the so-called moral responsibility of an individual (the burden of which he might well assume himself) the well-being of many is to be sacrificed The inadvisability of advocating "auto-prophylaxis" may conceivably be proved on medical grounds, but the ethical argument demands its own answer. Upon what grounds is the belief based that many individuals are deterred by fear? A thorough investigation of the ethical and scientific fundamentals involved might point to the adoption of a procedure in which these factors are coincident and not antagonistic, whether it be in the form of prophylaxis, early treatment, or some other method.

(2) We believe that if certain of the controversialists would reason more deeply and so reduce their suggestions to the lowest possible terms they would do much to clarify their vision and recognise their prejudices. For if the advocates of washing with soap and water as a protective measure at the time of exposure believe that such steps will make for safety it is manifestly their duty to publicly promulgate their view. If, however, it is proclaimed that safety lies this way, would not such an advocacy prove equally conducive to moral delinquency as the recommendation of "packets" or the utilisation of potassium permanganate and mercurial ointment? Similarly, granted the utility of early treatment, would not the proclaiming of its virtues by its sponsors also prove to be an incentive to immorality? Reducing the matter to its lowest terms, what difference is there, except that of the time factor between measures undertaken at the time of exposure or within a limited number of hours later? It is alleged that a difference does exist; in some instances it may rest on a purely sophistical basis, whilst in others it is one which may be conscientiously recognised. It is the duty of those who are in the latter category to make this difference clearer than they have hitherto succeeded in doing.

(3) Many of the data in favour of prophylaxis have been obtained from military sources. We are now called upon to cater for a civil population, and it is at least doubtful whether army statistics have been used in such a way that would satisfy a professional statistician.

(4) Neither the advocates of, nor the opponents of, auto-prophylaxis have sufficiently considered what is likely to result from such a procedure. In many cases the women concerned object to such measures, and men will therefore discard their use. This contingency would be met by the adoption of early treatment.

(5) In the communication which we publish above from the new committee three alternatives are mentioned: (i) the purely educational; (ii) delayed disinfection or early treatment; (iii) immediate self-disinfection. No mention is made of a modified form of compulsory notification such as is in use in the United States and some of our Dominions. No notice appears to have been taken of the influence which such a measure might have in reducing the number of people exposing themselves to the risk of infection.

A Combined Programme.

It may be hoped that both the Venereal Prevention Committee, the National Council, and all other interested bodies will consider the above points in a deeper, more comprehensive and judicial manner than has hitherto obtained. There may well be other cognate and crucial factors involved in the problem which have hitherto been unexplored. Time is undoubtedly of importance, but we must recollect that even the delay of a few months may result in the discovery of some new or the modification of some known method, which when materialised will more than compensate for the apparent loss of time at the moment. The points at issue between the Venereal Prevention Committee and the National Council are not of such a fundamental nature as to preclude some conjoined working between these two bodies. It would be a disaster if the work which the National Council has carried on, educationally and otherwise, should be hindered by needless antagonism on the part of the new committee. In the national interest these two bodies should meet to clear up possible misunderstanding and to discover such a common basis as will enable them to work together in a complementary manner without loss of individual consistency or of corporate efficiency.

IRISH PUBLIC HEALTH COUNCIL:
THE FIRST MEETING.

THE first meeting of the Irish Public Health Council was held at 33, St. Stephen's Green, Dublin, on Thursday, Oct. 2nd, Dr. E. COEY BIGGER, presiding.

Presidential Address.

After expressing the Chief Secretary's regret for his unavoidable absence and thanking the members for their willingness to act on the Council, Dr. Bigger went on to indicate the Minister's intentions. The Public Health Council as now constituted was a temporary body formed to advise him as Minister of Health as to the steps to be taken for the improvement of the public health. For this purpose representatives had been selected from the different existing authorities charged with public health functions throughout the country, and with their advice and assistance a comprehensive scheme of public health was to be formulated in a Bill to be submitted with all possible expedition to Parliament.

Public health legislation in England, Dr. Bigger went on, differed greatly from that enacted for Ireland, and recent debates in Parliament had made it quite clear why it was necessary to establish a Public Health Council. The more important and pressing problems with which the Council would have to deal were as follows.

The Council had been entrusted with the requisite authority for making inquiry into the present system of health administration, with a view to advising the Minister of Health for Ireland as to the steps to be taken to secure the preparation, effective carrying out, and coördination of measures conducive to health, including measures for the prevention and cure of diseases, the treatment and care of the blind, the initiation and direction of research, the collection, preparation, publication, and dissemination of information and statistics relating thereto, and the training of persons for health services.

Public Health in its Larger Aspect.

The Public Health Act of 1878 and the subsequent Acts had been chiefly concerned with the correction of sanitary defects, the isolation and treatment of infectious disease, provision of water-supplies and sewerage systems, rather than the correction of individual physical defects which lead to impaired health. During the last few years, however, attempts had been made to rectify those defects, and at least seven Acts of Parliament have been passed with the primary object of preventing rather than treating sickness. The most important of these Acts were: Notification of

Births (Extension) Act, 1915; Provision of Meals Acts, 1914–17; Midwives (Ireland) Act, 1918; Housing (Ireland) Act, 1919; Medical Inspection and Treatment of School Children Act, 1919. All these Acts had been initiated by the Local Government Board for Ireland. In addition, the Insurance Commission have never lost an opportunity of endeavouring to secure amendments in their original Act, with a view to securing more efficient working of the insurance system.

Despite the fact that no country could boast of more highly skilled physicians and surgeons, better equipped hospitals, or a more comprehensive system for the medical treatment of sickness of the poor, it had to be confessed that everything possible had not been done to prevent and treat disease. The cities were provided with well-equipped and well-staffed hospitals which gave to the poor specialist and operative treatment in no respect inferior to that available to the wealthy. An extension of the system of pay-patients would help immensely that very large class of persons who, while better off than the working class, could still not afford specialists and private hospitals. The same excellent conditions did not, unfortunately, hold in the smaller towns and in the country; often the only hospital accommodation was in the union infirmary with its so-called pauper taint or in the county infirmary, too often handicapped by lack of funds, and subject to conditions and limitations imposed by an Act of Parliament passed in 1765. To improve matters the former should be completely divorced from the workhouse and the latter given sufficient public money to modernise its equipment. Both, however, were useless without efficient staffs, and it was hopeless to expect to obtain and to keep these unless the conditions of service were improved.

Improvement in Sanitary Administration.

The fact that county councils, although entrusted with health and medical administration, are not sanitary authorities within the meaning of the Public Health Acts, had proved to be inconvenient. For instance, although a county council might undertake the management of sanatoriums and dispensaries for the treatment of tuberculosis, and appoint a medical staff for certain specific purposes, such as tuberculosis, medical treatment of school children, or a scheme under the Public Health Act, 1917, there was no power to appoint a county medical officer for the general superintendence of health matters. This defect could only be remedied by an Act of Parliament. The same so-called pauper taint was frequently applied to the dispensaries, which required to be better equipped and modernised. The obvious remedies by which these services might be improved would be by rewarding the skill and efficiency of the medical officers by a system of promotion to better positions, a more equable scale of salaries, increased facilities for better treatment and compulsory study leave every few years, which would enable every medical officer to keep abreast of the times by learning the most modern methods of diagnosis and treatment.

There must be a great extension in the providing of trained nurses to the sick. At present the only nurses available were those of such voluntary societies as the Queen Victoria Jubilee Nurses Association and the Lady Dudley Nursing Association. Properly qualified dental surgeons are urgently required, particularly in country districts, the inhabitants of which were often compelled to seek the assistance of unqualified persons. A system of itinerant dentists might partially meet the need.

Antituberculosis measures required consideration and enlargement. We could not hope to lessen the ravages of this disease to any great extent until every county had its medical officer, its dispensaries, its observation wards for suspicious cases, and arrangements for the isolation and treatment of open cases, whether these are early or advanced. In Ireland the facilities for laboratory diagnosis of disease were totally inadequate. Only a few counties had appointed a pathologist. A doctor who had no ready means of obtaining a report on pathological material was greatly handicapped in making a diagnosis. He should also be able to obtain when necessary such modern aids to treatment as vaccines and therapeutic sera.

The Care of Mothers and Young Children.

The field of preventive medicine in Ireland was as yet unexplored. The Notification of Births (Extension) Act, 1915, marked a new era, as this Act was designed for the purpose of ensuring that the health and physical welfare of the mother, both before and after the birth of her child, were looked after, as well as that of the child from the time of its birth onward till it reached the age of 5 years. In order to encourage the health authorities to undertake the care of mothers and children the State had come to their assistance and defrayed half the cost of maternity and child-welfare schemes. From the age of 5 years, which may be regarded as the school age, the child would come within the scope of the Medical Treatment of School Children Act, 1919. Under this Act county and county borough councils were compelled to provide for the medical inspection of school children and to make arrangements for attending to their health and physical condition. In the exercise of those duties the councils will act under regulations to be made by the Local Government Board, with the approval of the Treasury, and the Commissioners of National Education for Ireland. Parliament would provide one-half the cost of this service, and the remaining half would be borne by the rates. The examination for the detection of tuberculosis, adenoids, defects of vision, hearing, and dentition required extreme care if tendencies towards future serious defects were to be disclosed. There were many physical defects likely to interfere with the progress of the child's education which escaped the notice of parents until they passed a stage at which they could be easily remedied. The Regulations to be drawn up should ensure that this branch of health administration will be thoroughly and scientifically carried out. The Local Government Board had asked the Council to assist them in formulating regulations, and the Commissioners of National Education had also signified their willingness for the Public Health Council to coöperate. One of the first duties of the Council would be to endeavour to secure that the intentions of Parliament in regard to the medical treatment of school children are efficiently and economically carried into effect.

Other preventive measures, coming within the scope of the Council, were in relation to the milk-supply and the improvement of the housing conditions of the people. Government had already arranged to give liberal assistance to local authorities to enable them to provide commodious and healthy dwellings. Finally, the Council would have to deal with the initiation and direction of research on all subjects affecting or relating to health. The war has shown how much could be done by organised research in the investigation and treatment of disease, and even better results should be obtained in times of peace.

Discussion.

At the conclusion of the address an informal discussion took place regarding the conduct of business to be transacted at future meetings. These are to be convened by the Minister or Chairman when required, at intervals of about three or four weeks. It was not proposed at present to call in witnesses or outside assistance in the framing of new legislation. The coördination under one department of the various health activities came up for discussion and the various phases of health administration that might be brought into the purview of the Medical Services Bill. The immediate appointment of consultative councils was not contemplated.

Mr. J. EWING JOHNSTON, on behalf of the veterinary services in Ireland, assured the Council of the assistance of the veterinary profession, and particularly of the North of Ireland Veterinary Medical Association, in obtaining data in regard to public health. Contagious and infectious disease spread from animal to animal, from animal to man, and from man to animal, and to deal with such matters he contended that a central authority was required, with uniform regulations to be enforced in a uniform manner.

Mr. Johnston was asked to prepare for a future meeting of the Council a memorandum embodying in detail his proposals.

His Majesty the King has been graciously pleased to accept a copy of the memoir of the late Captain William Howard Lister, D.S.O., M.C., R.A.M.C., written by Dr. Walter Seton. The memoir, which was reviewed in our issue of August 16th, has been privately printed by the Medici Society, and copies are obtainable from the Senior Clerk, University College, London.

THE COMING ELECTION TO THE GENERAL MEDICAL COUNCIL:

THE CANDIDATES SELECTED BY THE BRITISH MEDICAL ASSOCIATION.

THE British Medical Association decided at the annual Representative Meeting in July last to support the candidature, in the forthcoming election of four Direct Representatives for England and Wales on the General Medical Council, of Dr. R. A. Bolam, O.B.E., (Newcastle), Dr. J. A. Macdonald, LL.D. (Taunton), Mr. E. B. Turner, F.R.C.S. (London), and Sir T. Jenner Verrall, LL.D. (Bath).

The election address issued jointly by the candidates runs as follows:—

To the Registered Medical Practitioners of England and Wales.

LADIES AND GENTLEMEN,—Postponed from time to time on account of the war the election of four Direct Representatives for England and Wales to the General Medical Council will take place early in November, and we venture to ask for your support and votes.

When the election was last held, in 1911, the foremost place in medical politics was taken by the proposals for National Insurance which were on the point of being adopted. So now, and in still greater measure, the Ministry of Health will provide many and serious subjects for professional consideration.

Arising from this there will be, doubtless, aims, desires, and difficulties for the profession, of which the General Medical Council should be kept fully acquainted, and it is thought that knowledge acquired by experience in practice and by service on the Council and Committees of the British Medical Association should secure this most efficiently. Such training has been received by all of us who are making our joint candidature, and we therefore offer ourselves for election.

Of the dangers of unqualified practice the Council has always been fully cognisant, and loses no opportunity of bringing them to the notice of the Government. We should gladly lend this our earnest attention and support.

Though the Council is primarily concerned with the regulation of medical education, it will be recognised that the duty is bound up with the subsequent professional life of students and with all those matters which bear on the efficiency and interests of the medical practitioner. The establishment of a Ministry of Health makes this consideration still more urgent and important.

Should you do us the honour of electing us as your representatives it will be our great desire to do all in our power for the credit and welfare of the profession, and to justify your selection.

R. A. BOLAM,
Physician to Skin Department, Royal Victoria Infirmary, Newcastle-on-Tyne; Member Consultative Council of Ministry of Health on Medical and Allied Services; Member of Council, British Medical Association.

J. A. MACDONALD,
Representative Member General Medical Council; Member Consultative Council of the Ministry of Health on Medical and Allied Services; Chairman of Council, British Medical Association; formerly Chairman of Representative Meetings, British Medical Association.

E. B. TURNER,
Vice-Chairman, Central Medical War Committee; late Member of Advisory Board, Ministry of National Service; Member of Council, British Medical Association; late Chairman, Representative Meetings.

T. JENNER VERRALL,
Representative Member, General Medical Council; late Chairman, Central Medical War Committee for England and Wales; late Member Advisory Board, Ministry of National Service; Member of Council, and formerly Chairman of Representative Meetings, British Medical Association.

The following covering letter initialed by the candidates is also issued to the constituency:—

General Medical Council Election.

DEAR SIR (OR MADAM),—We are forwarding to you a copy of the "Election Address" issued by us jointly and request the honour of your support.

To two of us (Dr. Macdonald and Sir Jenner Verrall) the work of the General Medical Council is well known through several years of service as Direct Representatives, and we have all a full knowledge of professional duties and responsibilities gained in the course of general practice, and in public medical work. Dr. Bolam and Mr. Turner, who now seek your suffrages for the first time, have special claims arising from their experience in matters affecting the public health. They have also held, and still hold, important official positions in the British Medical Association.

At the last election, eight years ago, the Association thought well to put forward candidates who should receive its organised support, and these all secured the approval of the electors.

It was believed that through the frequent discussions of medical politics by the Association the Direct Representatives might be given reliable information on the trend of medical opinion in the great problems of public health, and that the selection of those who were in constant touch with this source of information would be beneficial both to the public and the profession. It being determined that a similar selection of candidates should be made on the present occasion, we have been chosen by the Representative Meeting of the Association, an honour we greatly value.

It is our hope and desire that we may be entrusted with the duty of keeping the Council informed as to the mind of the profession generally in all the matters coming under the consideration of the Council; and this more particularly in those modifications of medical life and practice which are likely to follow the creation of a Ministry of Health.

On these grounds we ask not only for your vote, but for your assistance in securing the votes of your colleagues.

THE SYDENHAM AND THE ST. ALBAN'S MEDICAL DINING CLUBS.

A CONJOINT meeting of these two ancient dining clubs was held at the Grosvenor Hotel on Oct. 8th, under the chairmanship of Sir HENRY MORRIS, Bart., President of the St. Alban's Club, to celebrate the return to peace. It was their first meeting after an interval of 32 years, the previous one having been on the occasion of Queen Victoria's first Jubilee in 1887.

The Chairman's Address.

The CHAIRMAN, in proposing the toast of "The Clubs," said: "In spite of this apparent aloofness there is an inward bond of fellowship between them. They have one and the same object for their existence, and they are equally devoted to the memory of the great 'Father of English Medicine'—Sydenham. What used to be the 'Monday Club' is now known as the 'Sydenham,' and tradition has it that Sydenham was the first President of the St. Alban's Club. Both clubs have had the misfortune to lose their early minute books, so that the earliest extant written records date from 1775 in the case of the 'Sydenham,' and those of the St. Alban's from 1789.

Sydenham's Connexion with the St. Alban's Club.

Being desirous to find out, if possible, whether Sydenham's reputed connexion with the St. Alban's Club was consistent with known facts, and being aware that little or nothing is known of Sydenham's private life and personal history in London, I had recourse to the maps and plans of London made prior to and during his epoch. Bearing in mind that the St. Alban's Club is said to have derived its name from a street off Pall Mall in which the tavern was situated where the meetings of its members took place, and that Sydenham died on Dec. 29th, 1689, it was clear that if there was no St. Alban's-street in Sydenham's day either the tradition as to the origin of the name of the club or that of Sydenham's connexion with it as chairman must be rejected. I found that in no map or plan of London in the Tudor, the Commonwealth, or the Stuart periods—until towards the end of the reign of Charles the Second—was there anything more than a stray house in the open fields westward of the Haymarket and south of the line of Piccadilly which was then called the road to Redinge (Reading). But in a map published in 1680 by John Seller entitled 'A Map of the Cityes of London and Westminster, and the Burrough of Southwark, with their Suburbs, as it (sic) was rebuilt since the late dreadful fire,' as well as in the maps published throughout the eighteenth century down to Horwood's survey of London in 1792–1799, St. Alban's-street is shown as a broad and important thoroughfare exactly in the position now occupied by Waterloo-place at the lower end of Regent-street. It is quite possible, therefore, that the tradition that Sydenham was president of the St. Alban's Club at some time during the last eight or nine years of his life is correct.

Sydenham as the English Hippocrates.

It is interesting at the present juncture of medical history when we are hearing a good deal said in disapproval of the rigid individualism of the profession, and a good deal more in favour of unremitting laboratory research work, to note that the sole object of these two clubs was to develop and maintain good fellowship between the three great branches

of the profession by bringing physicians, surgeons, and general practitioners together in intimate social relations, and that the particular member of the profession with whose illustrious name and honoured memory each club has sought to associate itself is that of Sydenham—of Thomas Sydenham, the great bedside observer and pre-eminently *clinical* physician.

Sydenham has frequently been spoken of as the English Hippocrates, and many writers, for various reasons, have referred to him as the 'Emulator of Hippocrates.' Just as Hippocrates succeeded—at least during his own life time—in separating medicine from the wild, though erudite, philosophical doctrines of that time, and introduced an ennobling spirit and a high moral tone, together with great powers of intellectual observation and reasoning into the study and practice of medicine, so Sydenham, avoiding theological dogmas and vague philosophical speculations, made observation, experiment, verification, and the recognition of a 'plurality of causes,' the leading features of his practice and teaching. As he said of himself, the chief object of his life was 'to have the happiness of curing his patients and to reduce practice to a greater easiness and plainness,' and in the meanwhile not to rail at his enemies, opponents, and detractors.

Changes in the Corporate Body.

Gentlemen, in looking over the list of past and present members of any institution or corporate body with which we have long and closely been connected we cannot resist a sense of sadness at the losses in the personnel of membership; just as in passing along a street which has been familiar to us for a generation or more we cannot escape a twinge of melancholy when we think of the changes in the personnel of the inhabitants of the houses. These changes in the corporate body, like the changes which go on in our individual bodies as we advance from youth to manhood and from middle to old age, are so gradual and so intransient that we are prone to forget they take place. But there is this difference. In our own bodies, as we descend to old age, the impairment, though slow, is permanent, the loss of vigour is not made good, the depredations of time are not repaired, and deterioration goes on to actual decay; whereas in the corporate bodies the gaps are filled up, new blood takes the place of the old, and so vitality is maintained. In proposing the toast of the clubs I will therefore express the hope that it may be vouchsafed to every present member to enjoy good health, longevity, and happiness; and to the clubs, a vitality which will continue into the far, far distant future."

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

General Medical Council Election: The Candidature of Dr. Michael Dewar.

IN furtherance of his candidature as Direct Representative for Scotland on the General Medical Council, Dr. Michael Dewar, Edinburgh, addressed a largely attended meeting of the medical profession in the hall of the Aberdeen Medico-Chirurgical Society last week. He stated that he came forward as a general practitioner in actual practice. At present, he said, there were eight members from Scotland who were all consultants, specialists, or teachers, and there was an opportunity now of saying whether they wished to be represented by a specialist or by a general medical practitioner. In this connexion he referred to penal cases dealt with by the Council, where, he thought, if men knew that their cases were being considered and judged by a certain number of men who knew all the conditions of general practice, there would be less tendency on the part of these men brought up to feel that their cases were being dealt with harshly and unfairly. Dr. Dewar expressed himself as in favour of a fairly high standard of entrance examination for the medical curriculum and the compulsory inclusion of Latin. He felt that during the last few years there had been a tendency towards the lowering of the entrance examinations for the medical curriculum. He was strongly of opinion that there should be one improved system of admission, not only to the entrance examination to the medical curriculum, but also for registration; a minimum standard ought to be adopted and carried out by all examining boards. He also favoured total prohibition of unregistered dental practice, both in the interests of the profession and of the public. He was in favour of the maintenance and extension of the supervision over all professional examinations of the Council inspectors.

Scottish Mortality from Influenza, 1918–19.

In a supplement to the annual report of the Registrar-General for Scotland, Dr. J. C. Dunlop gives some interesting information regarding the extent of the influenza epidemic, and the mortality for which it was responsible. The period dealt with is from July, 1918, to April, 1919. The deaths reached their maximum in November, 1918, and during that month numbered 4272; the figure remained high until March, 1919, when there were 2529 fatal cases; in April, however, the deaths fell to 42, and as they thereafter remained low, the end of April may safely be used as an arbitrary date for the end of the epidemic. The total number of deaths ascribed to influenza was 17,575. The death-roll far exceeds that of all previous epidemics, not only of influenza but of any other infectious disease; only one, the scarlet fever epidemic of 1874–5, had a mortality amounting to more than one-quarter of that recently occasioned by influenza. The following comparative figures are of interest:—

Influenza, 1918–19	17,575	Diphtheria (maximum epidemic mortality)	3,615
Measles (maximum epidemic mortality)	3,639	Enteric fever ,,	1,625
Typhus ,,	3,272	Small-pox, 1872	2,448
Whooping-cough ,,	3,212	Cholera, 1866	1,270

Another striking feature was the universality of the epidemic, there being only five small districts—the largest with a population of 1238—in which no deaths from the disease were recorded. The figure given is equivalent to an annual death-rate of 4·3 per 1000 of the estimated population. A comparison of the death-rate from all causes during the influenza period, with that of the corresponding period immediately preceding, shows an increase of 26,199; this figure suggests that the mortality attributed to the epidemic is probably understated. Apart from old age and infancy, the death-rate was highest between the ages of 25 and 35, while it was lowest between 5 and 15. By far the most important complication was pneumonia, which was certified as present in 63·93 per cent. of the fatal cases.

University of Aberdeen: Opening of Medical Classes.

The medical classes of the University of Aberdeen opened on Oct. 9th for the winter session. The exact numbers are not as yet known, but the enrolments for the various classes are very large; the class-rooms will all be crowded. Professor C. R. Marshall, of the department of materia medica and therapeutics, delivered his inaugural lecture to a large audience of students and others, and other opening lectures were given.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Infant Life in India.

LECTURING before the Bombay Presidency Women's Council on "The Police and Women" Mr. F. C. Griffith, Commissioner of Police in Bombay, said that the three chief ways in which women could help the police were in regard to women criminals, infanticides, and the social evil. The lecturer declared that the present state of affairs regarding infanticide was a terrible blot on Indian social life. The extent of the evil was appalling, and the police were practically powerless in the matter. Many of the cases were impossible to detect. When a conviction was obtained the comparatively lenient punishment imposed was not an efficient deterrent. He affirmed that children were entitled to the same protection from the law as adults, but in India no one seemed to consider this point of view, and the matter remained in the hands of the unfortunate mother and her associates. Much of the infanticide so prominent in Bombay, he thought, was due to the social custom in India which forbade the remarriage of widows. He looked for the formation of a strong public opinion which alone could put a stop to the appalling loss of infant life, and hoped that social workers would devote their energies to the formation of such opinion and to the development of public conscience in the matter.

A paragraph in the health report of Bombay city calls for attention. It is as follows: "The number of live births

registered (in the three months reported on) was 4546. It exceeded the average of the corresponding quarters of the preceding decennium (1909–18) by 87. The number of deaths among infants was 4213." Of course it does not mean that of 4546 born 4213 died and only 333 survived more than three months. But it does show an infant death-rate which is a disgrace to a big city which boasts of a very high standard of civilisation.

Influenza in Madras.—Peace Memorial.

Influenza has recently made itself sufficiently serious to lead to grave anxiety on the part of the medical authorities. The corporation propose spending Rs.15,000 on precautionary and relief measures. The opening of depôts for the supply of drugs and of gruel and other similar foods for those who have fallen victims are the main features of these measures. Provided Eastern prejudice against Western medical methods can be overcome—and to this end a publicity campaign is being inaugurated—there should be a good chance of keeping the epidemic within bounds. Recently a meeting was held of a number of the leading medical men of the city, under the chairmanship of Colonel C. D'Monovan, I.M.S., at which, after the municipal health officer had given a short history of the last two waves of influenza, ways and means were discussed for minimising the epidemic. The chairman expressed the opinion that financial help should be forthcoming from the Government. A strong committee was elected to carry out the objects of the meeting, including representatives of the medical profession from the ranks of the I.M.S. and Indian practitioners.

The Peace Memorial for the Madras Presidency will consist of a building which will afford a home for the Madras Health Association and for other societies working for the improvement of the general conditions of living in Southern India.

Bengal Jails.

The report by Sir Walter Buchanan for the year 1918 is his "seventeenth and last," as he is now in England with the Ministry of Health. It deals with a year when jails were handicapped by shortage of establishment, disorganised by increased demands on their factories owing to the war, upset by the influenza epidemic, and struggling with that most serious of all difficulties, an inadequate and inefficient warder staff. During his association with the Bengal Jail Department Inspector-General Buchanan has witnessed many changes and many improvements. From a yearly average of over 65 per mille mortality has decreased to 20, and the Bengal jails, despite the evil reputation of some of the malarious riparian districts, are now among the healthiest in India. In fact, the present death-rate is maintained largely, we are told, by "the number of prisoners under trial who come ill to jail and die," for whose health, of course, the jail authorities have no responsibility.

Medical Scholarships for Indian Women.

The Government of India has awarded the State scholarship tenable in Europe by Indian women medical graduates to Miss Gulzar Mahomed Ali, M.B., B.Sc. (Allahabad). A special similar scholarship has been awarded to Miss Gulbai P. Patel, M.B., B.Sc. (Bombay).

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The French Congress of Surgery.

THE twenty-eighth Congress of Surgery in France was opened in Paris on Oct. 6th in the buildings of the Faculty of Medicine, under the presidency of Dr. Walther, surgeon to the Hôpital de la Pitié, and supernumerary professor to the Faculty of Medicine. The gathering was most distinguished, and comprised an unusual number of provincial and Belgian surgeons, as well as some from Switzerland and Italy. The President in his opening address spoke of the progress in surgical technique due to the war, and paid a tribute to the memory of many fallen surgeons. In the absence of M. Mourier, Secretary of State to the Service de Santé, Surgeon Inspector-General Toubert took his place, and in the course of his address welcomed the continuance of that collaboration between civilian medicine and the military health department, which had proved so fertile during the war. After the annual report of the French Association of Surgery had been read by Professor J. L. Faure, the technical part of the session began by the reading of the papers by MM. Jeanne (of Rouen) and A. Mouchet (of Paris) on the first subject before the meeting—closed traumatic lesions of the wrist. The session on the next day was devoted to the study of diverse questions: anæsthesia, heliotherapy in the treatment of war wounds, grafts, and various forms of plastic surgery. The third day was reserved for the study of the second question on the agenda—the operative treatment of cancer of the tongue—after the paper by MM. Lebileau (of Paris) and Vallas (of Lyons) had been read. The mornings were devoted to operating demonstrations in the principal surgical departments of the Paris hospitals. Among the most original communications was one by Dr. Voronof, who has grafted bits of testes into old animals and observed the renewed vigour of their sexual functions. He hopes to be able to apply these experiments to man. A communication by M. Roederer dealt with misdeeds in the surgical practice of German surgeons on prisoners of war, while M. Barbarin described his experience of bone-grafting in Pott's disease. At the end of the congress there was established, on the initiative of Dr. Reynès (of Marseilles), a professional union of physicians and surgeons attached to Paris hospitals, with the object of upholding their rights against abuse by administrators of hospitals and of Friendly Societies.

Strikes and Hygiene.

At the beginning of October a strike broke out among municipal employees in the outskirts of Paris. All services connected with the town-halls, such as registration of births, deaths, and marriages, and the water-supply, were suspended for several days. In many parishes there was no water in the houses, and the inhabitants had to supply themselves from public fountains. As the weather was very hot at that time many people used the water of the Seine, of the Marne, or of small springs. The resulting typhoid epidemic which has just broken out in those parishes in which water was lacking furnishes a new proof of the danger of the deliberate neglect of public duty at a time when all the elements of modern city life are separately and jointly necessary for the work of the others.

Natural Prophylaxis as regards Malaria.

At the Academy of Science M. Roubaud showed that the reason why malaria is not more virulent in our country is that the anopheles tends to bite animals in preference to man. Wherever the ox, the horse, or, above all, the pig, are easily accessible man is relatively spared. Wherever the fauna is sparsely distributed, as in the marshy regions of the Vendée, the anopheles, if abundant and unable to find sufficient nourishment in domestic animals, attacks man. An experiment in this connexion was made in the Island of Anticosta, where malaria has disappeared in man since the introduction of animals in abundance, and especially pigs and Virginian stags.

Arsenobenzol as Abortive Treatment of Syphilis.

Continuing experiments performed in England on this subject, MM. Fournier and Guénot have just concluded a demonstration on the same lines, establishing the value of "606," not only as a cure, but as a means of preventing the development of syphilis. They administered a small dose to 40 women who some days before had been in contact with syphilitics at the infectious stage. Not one of the women thus treated showed the slightest sign of syphilis. On the other hand, five women who had been exposed to the infection under identically similar conditions and who had refused abortive injections, became infected with syphilis at the end of the normal incubation period of 20 to 30 days. These experiments may have consequences all the more important in that syphilis has unfortunately become much more prevalent since the war. They tend to prove that treatment by arsenobenzol, applied during the incubation period, is capable of preventing the eruption of syphilis.

ASSOCIATION OF INFANT WELFARE AND MATERNITY CENTRES, Tavistock-square, London, W.C.—A conference of medical officers of infant welfare and maternity centres will be held on Friday, Oct. 24th, at 6 P.M., at Bedford College for Women, Regent's Park, N.W., to discuss the feeding of infants and young children in view of the shortage and high price of cow's milk. Special reference will be made to the use of dried milk and patent foods.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

A quarterly meeting of the Council was held on Oct. 9th, Sir George Makins, the President, being in the chair.—The Secretary reported the death on Sept. 6th, at the age of 78, of Mr. Thomas Pickering Pick, past Vice-President and past member of the Council and of the Court of Examiners. The following resolution was passed:—

"The Council hereby express their deep regret at the death of Mr. Thomas Pickering Pick, past Vice-President of the College, and their sincere sympathy with the members of his family in the loss which they have sustained. The Council do also record their grateful remembrance of the many services rendered by Mr. Pick to the College in the conscientious discharge of the several duties which devolved upon him as Vice-President, member of the Council, and of the Court of Examiners."

The thanks of the Council were given to Mr. Scoresby Routledge for presenting to the College a collection of skulls and skeletons from Easter Island.—Mr. F. F. Burghard, on behalf of the committee on the annual report of the Council, submitted a draft copy of the report to be presented to the Fellows and Members at the annual meeting on Thursday, Nov. 27th. The report was approved.—The President reported that the first Thomas Vicary lecture would be delivered by Sir John Tweedy on Wednesday, Dec. 3rd, at 5 P.M., when the Lord Mayor-elect, Sir Edward Cooper, Master of the Barbers' Company, proposed to be present, and that the Bradshaw lecture on the Surgery of the Heart would be delivered by Sir Charles A. Ballance on Thursday, Dec. 11th, at 5 P.M.—The chairman of the Court of Examiners called the attention of the Council to the necessity of discontinuing for the time being the examination in operative surgery for the Fellowship in view of the extreme shortage of bodies for dissection. It was referred to the Court of Examiners to arrange an examination to take the place of the examination in operative surgery during the continuation of the difficulty in obtaining bodies.—A letter was read from the Minister of Health thanking the College for assisting him in the exercise of his responsibility for appointing the Consultative Council in England on Medical and Allied Services and enclosing the list appointed.

URBAN VITAL STATISTICS.

(Week ended Oct. 11th. 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had increased from 10·4 to 12·0 in the four preceding weeks, further rose to 12·2 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 13·0, or 0·8 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 5·3 in Barrow-in-Furness, 5·9 in Edmonton, and 6·0 in Leyton, to 19·5 in Great Yarmouth, 21·0 in Stockton-on-Tees, and 22·0 in South Shields. The principal epidemic diseases caused 364 deaths, which corresponded to an annual rate of 1·1 per 1000, and comprised 222 from infantile diarrhœa, 53 from diphtheria, 31 from measles, 28 from whooping-cough, 22 from scarlet fever, and 8 from enteric fever. Measles caused a death-rate of 1·5 in South Shields and 1·8 in Tynemouth. The deaths from diarrhœa were 70 below the number in the previous week, and included 184 in London, 18 in Liverpool, 9 in Sunderland, and 7 in Leeds. There were 1968 cases of scarlet fever and 1290 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1796 and 1206 respectively at the end of the previous week. The causes of 25 deaths in the 96 towns were uncertified, of which 7 were registered in Birmingham and 3 each in Liverpool, South Shields, and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had been 10·5, 11·9, and 10·8 in the three preceding weeks, further fell to 10·2 per 1000. The 216 deaths in Glasgow corresponded to an annual rate of 10·1 per 1000, and included 7 from infantile diarrhœa, 5 from diphtheria, 2 from measles, and 1 each from enteric fever and whooping-cough. The 71 deaths in Edinburgh were equal to a rate of 11·0 per 1000, and included 3 from diphtheria, and 1 each from measles and whooping-cough.

Irish Towns.—The 112 deaths in Dublin corresponded to an annual rate of 14·4, or 1·3 per 1000 less than that in the previous week, and included 6 from infantile diarrhœa, and 1 each from scarlet fever and diphtheria. The 104 deaths in Belfast were equal to a rate of 13·5 per 1000, and included 3 from infantile diarrhœa, and 1 each from enteric fever, measles, scarlet fever, and whooping-cough.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Dec. 31st, 1918.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	41	0·10	1·83	3·27	1·14	3·45	9·79	0·82	0·40	0·04
Embankment Gardens	44	0·55	14·24	24·08	4·42	8·67	51·93	4·81	0·99	0·27
Finsbury Park ...	65	0·04	1·15	3·90	3·07	5·39	13·55	3·31	0·64	0·09
Ravenscourt Park	56	0·03	1·88	3·93	2·53	3·94	12·31	2·08	0·53	0·13
Southwark Park	28	0·22	0·96	2·82	1·79	2·27	8·06	3·19	1·15	0·13
Victoria Park ...	38	0·06	0·75	1·52	3·83	7·94	14·10	1·22	0·44	0·03
Wandsworth Com.*	—	—	—	—	—	—	—	—	—	—
Golden Lane ...	55	0·13	2·14	2·75	1·74	4·14	10·91	1·87	0·73	0·20
Malvern*	—	—	—	—	—	—	—	—	—	—
Manchester—										
Whitworth Street (garden)	118	—	—	—	—	—	16·80	—	—	—
,, (roof of College)	116	—	—	—	—	—	15·90	—	—	—
Newcastle-on-Tyne	71	0·14	3·16	6·23	2·57	2·57	14·67	1·71	0·48	0·24
Rochdale	—	—	—	—	—	—	23·16	—	—	—
St. Helens	109	0·31	2·27	4·87	2·46	8·19	18·10	4·91	1·96	0·08
Southport—										
Hesketh Park ...	168	0·04	0·35	0·62	2·51	6·23	9·75	2·85	1·26	0·01
Woodvale Moss...	128	—	—	—	—	—	9·86	—	—	—
SCOTLAND.										
Coatbridge	82	0·13	2·54	6·71	3·75	6·44	19·57	4·76	0·35	0·15
Glasgow—										
Alexandra Park...	87	0·10	2·07	3·73	2·64	5·45	13·99	2·43	0·39	0·22
BellahoustonPark*	—	—	—	—	—	—	—	—	—	—
Blythswood-sq. ...	105	0·16	1·63	4·04	2·94	4·92	13·69	2·26	0·37	0·27
Botanic Gardens	116	0·13	1·78	4·24	2·64	8·37	17·16	2·88	0·37	0·17
Richmond Park*	—	—	—	—	—	—	—	—	—	—
Ruchill Park ...	116	0·11	1·85	1·87	3·38	4·62	11·83	2·40	0·32	0·25
South Side Park.	94	0·08	1·01	1·56	1·79	4·82	9·26	2·30	0·38	0·28
Tollcross Park* ..	—	—	—	—	—	—	—	—	—	—
Victoria Park* ...	—	—	—	—	—	—	—	—	—	—

Jan. 31st, 1919.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office*	—	—	—	—	—	—	—	—	—	—
Embankment Gardens	43	0·12	2·68	5·64	4·12	6·24	18·80	3·66	0·82	0·13
Finsbury Park ...	52	0·07	1·05	3·02	4·89	11·31	20·33	6·50	0·89	0·22
Ravenscourt Park	79	0·07	1·16	2·12	3·52	5·13	12·40	3·08	0·88	0·18
Southwark Park...	52	0·06	1·59	3·80	5·81	7·18	18·44	6·28	0·86	0·41
Victoria Park* ...	—	—	—	—	—	—	—	—	—	—
Wandsworth Com.	6	Nil	Nil	Nil.	0·33	0·55	0·88	0·35	0·13	0·01
Golden Lane ...	66	0·14	2·84	3·24	1·59	4·23	12·04	2·05	1·08	0·19
Malvern*...	—	—	—	—	—	—	—	—	—	—
Manchester—										
Whitworth Street (garden)*	—	—	—	—	—	—	—	—	—	—
,, (roof of College)*	—	—	—	—	—	—	—	—	—	—
Newcastle-on-Tyne	60	0·24	5·87	8·84	2·03	6·33	23·30	2·15	0·76	0·13
Rochdale†	—	—	—	—	—	—	—	—	—	—
St. Helens	86	0·34	2·11	1·96	6·96	13·66	25·03	7·10	3·26	0·07
Southport—										
Hesketh Park ...	104	0·03	0·48	1·05	1·30	5·42	8·29	1·19	1·25	0·01
Woodvale Moss...	70	—	—	—	—	—	6·44	—	—	—
SCOTLAND.										
Coatbridge*	—	—	—	—	—	—	—	—	—	—
Glasgow—										
Alexandra Park‡	75	0·11	1·87	2·95	2·76	5·60	13·29	3·22	0·44	0·15
BellahoustonPark*	—	—	—	—	—	—	—	—	—	—
Blythswood-sq. ‡	82	0·16	5·35	4·28	2·03	5·42	17·24	3·33	0·34	0·19
Botanic Gardens	94	0·12	4·16	4·16	2·71	7·29	18·44	4·32	0·34	0·17
Richmond Park*	—	—	—	—	—	—	—	—	—	—
Ruchill Park‡ ...	91	0·13	1·71	2·29	1·72	5·13	10·98	2·89	0·27	0·13
South Side Park ‡	88	0·09	1·10	2·22	1·03	5·00	9·44	2·19	0·26	0·04
Tollcross Park* ...	—	—	—	—	—	—	—	—	—	—
Victoria Park* ...	—	—	—	—	—	—	—	—	—	—

* No returns. (The Meteorological Office sample was partly lost owing to frost.) † Gauge interfered with. ‡ Lead present.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9 lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office are made in THE LANCET Laboratory.

Correspondence.

"Audi alteram partem."

CONJUGAL TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—The statistical figures which Dr. E. Ward brings forward in his paper in THE LANCET of Oct. 4th to prove conjugal infection seems to me neither conclusive nor convincing. All such statistics ignore the possibilities of chance association and the difficulties of tracing and diagnosing early cases. Mere presence of tuberculosis among married people or among those living under the same roof no more proves that one has infected the other than cases of gout, rheumatism, or toothache occurring among members of the same family or in the same house prove that they are infectious. The universal prevalence of tuberculosis among civilised countries and its commencement in childhood render worthless all statistical conclusions that bear upon conjugal infection. For if practically every civilised being is tuberculous a very large number of cases of the disease must occur among husband and wives independent of any infection, and if tuberculosis begins in early childhood no one can say when and how infection took place. Before we can form an opinion as to whether the marital relationship influences the occurrence of tuberculosis we must prove that its observed frequency is greater than the expected frequency.

After a careful and exhaustive study of the question Dr. Charles Goring came to the conclusion that "the correlation of infection of tubercular disease from association in marriage is both negative and insignificant—that is to say, healthy individuals are not, upon the evidence of our data, infected by marriage with tubercular mates." In my 20 years of sanatorium records we cannot honestly find that even in one half per cent. of cases the husband or wife infected the other. In my book on Pulmonary Tuberculosis (1910) I give three remarkable cases of working men's wives who nursed their consumptive husbands all through their fatal illness, but who nevertheless did not contract the disease. Many such cases of negative evidence have since multiplied.

The term "infection" is so loosely applied in connexion with tuberculosis that what is meant in many instances is a mere incidence or disposition of the disease occurring among persons living under the same roof, under similar social, economic, or unhygienic surroundings. Keeping in mind the universality of tuberculosis and its childhood commencement, if the prevalence of the disease is a little more common among the married people than others, all we can reasonably infer is that at least in a large majority of such cases the disease that has been lying latent for a considerable time has been roused into activity by the stress and strain of married life. Tuberculosis is so widely prevalent among the civilised communities that the idea of its infectious character has lost much of its meaning and potency. If the time spent in hunting after house infection, contact infection, and marital infection, we could devote in investigating the living problems of the present day—viz., the food problems, the social, economic, and psychologic problems that daily concern the individual and the nation—I am sure we would be rewarded in finding a true solution as to the relative merits of the various factors that underlie the causation of tuberculosis.

I am, Sir, yours faithfully,

Mendip Hills Sanatorium, Oct. 11th, 1919. C. MUTHU.

NURSE ANÆSTHETISTS.

To the Editor of THE LANCET.

SIR,—There is an aspect of this subject which your leading article of Sept. 27th does not envisage. To give a nurse the charge of the anæsthetic is to commit the offence of "covering." The General Medical Council has on more than one occasion visited with exemplary punishment medical practitioners who have administered anæsthetics for operations undertaken by unregistered persons, whether these latter assumed the rôle of a surgeon or a dentist. Presumably the converse—i.e., for a qualified person to seek the aid of an unqualified one to act as anæsthetist—is equally reprehensible. Such a procedure is allowed in cases of emergency when no qualified man is accessible, but this exception does not invalidate the law's contention that an act of covering is an indictable offence. It may be urged that in the practice of obstetrics a nurse is commonly called upon to assist with the anæsthetic, but even here the act is illegal, although perhaps condoned by custom, since an element of emergency arises in such cases and the medical attendant usually anæsthetises the patient, although he may allow the nurse to "carry on."

In present circumstances, committing the anæsthetic to a nurse, however highly trained, is to admit the principle of unqualified practice This leads to a very wide door being opened to unqualified practice by not only highly trained nurses, but by unqualified men and women whose training is less complete and whose ideals are less desirable. It may be considered by some that the individual acting as an anæsthetist should be merely an adjunct to the operator, but since the latter has quite enough to worry him if he gives his undivided attention to the operation, his supervision of the anæsthesia is only perfunctory and so useless as a safeguard against mischance. Those who know anything about modern anæsthesia recognise that the mere handicraft aspect of the subject is the least important. To be an anæsthetist one must be a physiologist, a physician, and a surgeon, since the physiological knowledge compels familiarity with the action and interaction of the agents employed; the possession of a physician's acumen enables the anæsthetist to gauge the condition and resistive power of the patient towards the anæsthetics employed, while only surgical experience can enable the anæsthetist to know the requirements of the operator, the necessities of the operation, and to really assist, qua anæsthesia, the surgeon's manipulative skill. Can any training short of the full medical curriculum really give an honest basis to the person who sets forth to learn how to anæsthetise?

It is futile to suggest that because some nurses and V.A.D.'s have proved themselves clever as handicraft anæsthetists, while many medical men have revealed inefficiency in this department of practice, that therefore the former class should be entrusted with the care of patients who have to face the risks of anæsthesia. No medical man without special training is a satisfactory or safe anæsthetist. Theoretically every medically registered person is competent to perform any major operation, give any anæsthetic, or undertake an iridectomy. However, comparatively few can do any of these things properly. Indeed, some bone-setters are better at the manipulative work than many surgeons, but they lack the foundation of training in pathology necessary for the superstructure of the application of knowledge to practice. This is equally true as regards anæsthetics and their uses if we are to consult the best interests of our patients.

I am, Sir, yours faithfully,

Oct. 12th, 1919. DUDLEY W. BUXTON.

To the Editor of THE LANCET.

SIR,—I think there is a risk when anæsthetics are administered by a nurse greater than when they are administered by a qualified man. I have had considerable experience of the administration of anæsthetics by nurses during labour. They have not been trained to watch for the small warnings which a doctor looks out for almost instinctively, and, as a result, I have had in my own practice three cases which caused me anxiety. If one is busily engaged one cannot at the same time keep a very close eye on the nurse administering the anæsthetic, and I have laid down for myself the rule that if a doctor is by any means available I do not allow the nurse to give the anæsthetic.

What is true of labour cases is of more importance in abdominal operations when a badly administered anæsthetic adds greatly to the danger and subsequent discomfort of the patient, and where only a competent and thoroughly trained anæsthetist knows how to prevent the straining which adds so much to the difficulty of the operation.

My view is that if we allow anæsthetics to be administered by one who is not a qualified medical practitioner we are subjecting our patient to a risk which is unnecessary in the majority of cases. If, however, the case is one of emergency and a doctor is unavailable, we are justified in allowing the nurse to administer the anæsthetic under our own super-

vision. In any case when an anæsthetic is administered by an unqualified person the doctor present must be held solely responsible for what happens.

I am, Sir, yours faithfully,
HERBERT WILLIAMSON.

Queen Anne-street, W., Sept. 29th, 1919.

TRANSMISSION OF INFECTIVE DISEASE BY SUCKLING.

To the Editor of THE LANCET.

SIR,—The publication of Dr. H. Heiman's case in your issue of Oct. 11th (p. 653), has brought to my recollection a case of typhoid in a nursing mother with a four months' old infant I had some 12 years ago. A positive Widal was present and an enlarged spleen and rose spots. There was no history of an analogous previous attack. As the child had been breast-fed for the first 10 days of the illness, during which time the disease was unrecognised, I yielded to the importunities of the mother and consented to the breast feeding being continued. The mother's illness ran a mildish course and she continued nursing right through it, and the child escaped infection.

Three years ago I attended a lady in her second confinement, which was quite normal. Twenty-four hours after, her temperature ran up and she exhibited a large crop of typical varicella spots. She then stated that she had noticed two spots on the abdomen on the day previous to her confinement. These spots also were found to be typical in character. On the beginning of the seventh day the infant developed a typical rash.

As the experience of years has shown the incubation period of varicella to be about 21 days, it seems to me that this case proves that the virus was transmitted via the placenta. I am, Sir, yours faithfully,

Chiswick, W., Oct. 13th, 1919. H. O. BUTLER.

WAS ST. LUKE A PHYSICIAN?

To the Editor of THE LANCET.

SIR,—With respect to Professor H. J. Cadbury's opinion, quoted in the review of "The Style and Literary Method of Luke" in THE LANCET of Oct. 11th, that the use of medical terms by St. Luke does not justify the opinion of many scholars that he was necessarily a medical man, it is surely right to state that Harnack, whom he refers to, was the foremost biblical scholar in Germany, and declared that the evidence in favour of his professional knowledge was overwhelming. I would ask, Need we go further in discussing this matter than accept St. Paul's reference to his companion, "ὁ ἰατρὸς ὁ ἀγαπητός"?—I am, Sir, yours faithfully,

DYCE DUCKWORTH,
Oct. 12th, 1919. Vice-Provost, Guild of St. Luke.

IONISATION FOR SEPSIS.

To the Editor of THE LANCET.

SIR,—I think the article by Captain F. W. Baker Young in your issue of Sept. 20th and the letter by Dr. A. R. Friel in that of Oct. 4th need a comment by one who has long been interested in the effects of the constant current upon bacteria in liquids. In view of Captain Young's failure to find any description of apparatus for such observations may I call his attention to an article contributed by me to THE LANCET of July 3rd, 1909, on the Electrical Reactions of Bacteria. In this article a figure was given showing a slide which was filled with a bacterial suspension through which a current could be passed and the effects watched through a microscope. I also gave my reasons for abandoning such a method. Observations of that sort are liable to serious fallacy owing to the currents set up by surface tension variations and vortex effects due to the bursting of gas bubbles generated by the electric current. A second figure showed a simpler and better apparatus subsequently demonstrated at meetings of the Royal Society of Medicine, the British Medical Association's annual meeting, and at the Dresden Hygiene Exhibition in 1911 by Mr. Armit on my behalf.

Captain Young's results in the treatment of suppurating wounds by the use of electrolysis in saline solution confirm those obtained by Mr. C. R. C. Lyster and myself at the Middlesex Hospital in 1913, and mentioned in THE LANCET of Feb. 14th, 1914.

In regard to Dr. Friel's letter, when reporting my findings of these bacterial movements to the Royal Society, B, vol. lxxxi., 1909, I advanced the theory of an affinity between the chlorine ion and the bacterial envelope to account for the manifest movement. This theory is fortified by the observation that the velocity of the bacterial movement corresponds fairly well with the known ionic velocity. For the germicidal effect which soon ensued at the anode—when using sodium chloride as the electrolyte—one need, I think, invoke no more than the lethal effect of chlorine upon bacteria. I am, Sir, yours faithfully,

CHARLES RUSS, M.B., M.R.C.S.

Beaumont-street, W., Oct. 11th, 1919.

FALLACIES IN THE MEASUREMENT OF BODY-WEIGHT.

To the Editor of THE LANCET.

SIR,—To weigh the body more often than once a day would be waste of time; and it is, at least, doubtful whether daily weighings, even in fever, are worth their trouble. The following remarks are not concerned with that question, nor with the conclusions based upon daily weighings in Dr. MacNaught Scott's note on Diurnal Variation published in your last issue (Oct. 11th). They deal merely with the fallacies incidental to the customary weekly or fortnightly weighings as usually conducted. Bearing in mind that more than half of the weight of the body (and likewise of all solid food) is water, any variations in weight may be regarded as due, for the greater part, to variations in its water content. It is well known that the kidney is at times capable of abstracting water from the blood with great rapidity. Under the nervous influence of a variety of stresses—emotional, thermal, bowel-regulating, and others—it often happens that within 10 minutes after thoroughly emptying the bladder a large quantity of urine is again discharged. That source of error in our reckonings is less difficult to avoid than that which arises from the daily variations in the output from the bowel. The remaining source of error is completely avoidable; it goes without saying that in all comparative clinical weighings the weight of the clothing should not be merely estimated approximately, but should be kept strictly identical. These considerations have led me to utilise the only opportunity within the 24 hours when optimum conditions can be secured in respect of those gross factors of error—namely, on rising from bed in the morning, before any thermal or other stresses have come in, before taking any food or drink, before evacuating the bowel; but always *immediately after* a complete emptying of the bladder, and always whilst wearing *the same* dressing-gown. This seems to be the best, and as I think the only reliable method for keeping a true record of genuine variations in body-weight. Even in hospital wards it can be carried out with little trouble if the weighing machine is mounted on wheels.

I am, Sir, yours faithfully,

Upper Brook-street, W., Oct. 11th, 1919. WILLIAM EWART.

THE POSITION AND PAYMENT OF THE PENSIONS BOARDS.

To the Editor of THE LANCET.

SIR,—In reply to the letter signed "Member of Pension Board" in your issue of Sept. 6th, complaining of the unnecessary amount of writing to be done by members of boards, may I remark that the possibility of the clerical staff doing more of this work is under consideration, I am informed. A letter has recently been circulated to this effect. The duplicate cards certainly give some extra work now, because, in order to fulfil their object, the summaries of all past boards have to be made and entered thereon; but when once this initial stage is passed writing work for the future should be much curtailed. All boards then would require the completion of only *one* A 36/C (which previously had to be rendered in duplicate), together with such summary as the president may see fit to dictate for each card. The suggestion that cards should be filled up in a quiet room by a capable medical man some time after the board would entail, I am given to understand, the addition of at least two medical men for each area of six boards. The objection that at present one or two pensioners less (per session) can be examined by each board should be counterbalanced later

by the saving of time when the card-index system gets into proper working order.

The examining doctor who wishes to look at the man's past documents could do so before examination of the patient; many members of pensions boards prefer to investigate each case with an unbiased mind, and only after examination do they wish to compare their independent conclusion with that arrived at by previous boards.

I am, Sir, yours faithfully,

Oct. 2nd, 1919. ANOTHER MEMBER OF PENSIONS BOARD.

JOHN HUNTER'S BEARD AND MASK.

To the Editor of THE LANCET.

SIR,—Most medical men are familiar with Reynolds's great picture of John Hunter. It was painted in 1785 when Hunter was in his fifty-eighth year. When giving the centenary lecture to the Hunterian Society in the Apothecaries' Hall last week I had an opportunity of examining Reynolds's less-known picture of Hunter, which hangs there. A comparison of this picture with the greater work in the Council Room of the Royal College of Surgeons of England leaves no doubt that the picture in the Apothecaries' Hall represents a preliminary picture or sketch of the final and triumphant effort at the College of Surgeons.

One feature of the Apothecaries' Hall picture has puzzled students of Hunter, for there he is represented with a thin beard made up of long straggling hairs. I infer that Reynolds felt that a successful portrait was impossible until this beard had been got rid of, and therefore proposed that a plaster mask of his sitter's face should be taken—a proposal which would certainly have appealed to Hunter. At least we know that a mask of Hunter's face—one which is usually described as a death-mask, but has all the marks on it of a life-mask—was taken then at Reynolds's suggestion. William Norris, in the Hunterian Oration of 1825 (p. 35) states: "Whilst, however, Sir Joshua was engaged on this portrait, he requested Mr. Hunter to let a caste be taken from his face." The orator goes on to describe how this mask was discovered at a later date in a lumber-room and used by Chantry in fashioning his bust of Hunter. Hunter himself mentions the taking of this mask (Palmer's edition, vol. iii., p. 88); it gave rise to "the cells of the skin of the nose being loaded with extravasated blood," which he remarked soon turned from a "florid red to a dark purple."

I had come to the conclusion from a study of the mask itself that it had been taken during life before I came across the above records. But it was not until I again examined the picture at the Apothecaries' Hall that I realised the relationship between the cast and the beard. We have here, I think, an example of the adroit skill with which Reynolds could deal with his sitters. The beard had to go before the mask could be taken! There is the traditional story of Reynolds being dissatisfied with his earlier efforts and of his turning his canvas round and beginning his picture again. I think the straggling beard represents the real difficulty which had to be overcome.

I am, Sir, yours faithfully,

ARTHUR KEITH.

Royal College of Surgeons of England, Oct. 13th, 1919.

VASELINED LINEN THREAD.

To the Editor of THE LANCET.

SIR,—Linen thread prepared in the following simple manner has proved very satisfactory in my work both with the Salonika Forces and, since my return, in the Richmond Hospital, Dublin. Barbour's linen thread with a hard or "satin" finish is employed. Nos. 30, 60, and 90 are the most convenient sizes. I use the thread undyed, but if distinctive colours are desired the same quality thread can be had iron-dyed. The thread is loosely wound on glass reels, using a separate size or colour of reel for a particular thickness of thread. The reels are now sterilised in vaseline, which is slowly raised to 140° C. and kept at this temperature for 20 minutes. No special apparatus is necessary for this purpose. To facilitate the removal of the reels out of the hot vaseline I usually knot the thread round the reels, leaving a loose end, and grip all the ends tog-ther in an artery forceps. To remove aseptically the excess of vaseline from the thread the reels are next wrapped in sterilised gauze and placed in a drum, which is treated with the ordinary dressings in the steam steriliser. The thread is stored in spirit or biniodide-spirit.

Linen thread so prepared has a distinct but extremely delicate coating of vaseline which is present round every filament of the thread. As a ligature and suture material it has many advantages. It is not an irritant, being soft and pliable it is easily drawn into a tight knot and having a smooth surface it does not traumatise the tissues when used as a suture. It is very strong and keeps indefinitely. The absence of capillarity prevents infection passing along the thread. It is easily prepared and very pleasant to work with. Vaselined linen thread has been in constant use now for almost two years. I have personally employed it as a general ligature and suture material in more than 200 operations and have never had cause to regret its employment.

I am, Sir, yours faithfully,

Richmond Hospital, Dublin. R. V. SLATTERY, F.R.C.S.Irel.

THE LESSONS OF FAILURE.

To the Editor of THE LANCET.

SIR,—I am glad to see in THE LANCET of Oct. 11th Dr. H. Warren Crowe's article on Some Causes of Failure in the Vaccine Treatment of Arthritis, Rheumatism, and Neuritis, for two reasons: first, because the writer's idea of bringing forward causes of failure in more or less novel forms of therapeutics is well advised; and second, because when I was more in touch with general vaccine treatment than now I saw much of failure and little of success. I cannot agree with his regret at the number of cases of failure he expresses, for assuredly if a mode of treatment has in it some lasting value one well-reported failure is worth a dozen successes. A well-known practitioner of vaccine treatment is a pioneer, and a pioneer will "get there" none the worse, to say nothing of those who follow him, if he marks publicly his own wanderings from the best path in the country through which he has passed. Nothing strikes one more in the recent memoir of a great pioneer than the scrupulous care and open statement of his failures that strewed the pathway of Lister to truth that will never perish. What he had omitted to do, what he had done wrong were exposed in lectures, addresses, and at the bedside; they were *his* omissions and *his* failures. It is hard enough to read aright one's own failures, when ostensibly all the facts are known to us, but harder indeed to read those of other workers whose knowledge, skill, and care are unknown to us. I am led to say this because the writer gives only one example, which I suppose was a case of his own, under the five headings as to causes of failure, and that one is not a failure properly so-called but an instance of an experiment with this modern method, as, indeed, vaccine treatment in general is at present. This precaution will need to be observed closely in the other numerous forms of treatment that have emerged through the years of war. Let us, then, have cases of failure as well as causes of failure.

I am, Sir, yours faithfully,

Oct. 11th, 1919. M.D.

THE MEDICO-LEGAL SOCIETY.—In issuing the report and list of members of this society the honorary secretary pleads for new members now that the war is over, and states that offers of papers to be read at the society's meetings will be welcomed. The annual dinner will be held at the Holborn Restaurant at 7 P.M. on Wednesday, Oct. 29th, when several guests of eminence, both in law and medicine, are expected to attend. Tickets, 14*s*. each, may be obtained from the honorary secretary, 3, South-square, Gray's Inn, London, W.C. 1.

THE LATE MR. EBENEZER SNELL.—Ebenezer Snell, M.R.C.S. Eng., L.S.A., who died at his residence in Brighton on Oct. 13th, aged 76, was a student at Middlesex Hospital and qualified in 1864. After holding a house appointment at the Isle of Man General Hospital and Dispensary he became medical officer to the House of Industry at Douglas. He afterwards resided at Ketton, near Reading, and in 1891 went to Brighton, where he was one of the original members of the Royal Naval Volunteer Reserve, and held the rank of surgeon-lieutenant-commander in the Sussex Division. He was also Admiralty surgeon and agent. His son, Mr. J. P. B. Snell, has followed his father's profession, and is on the West African Medical Staff.

The Services.

THE HONOURS LIST.

THE following appointments and promotions for services rendered in connexion with the War are announced:—

K.C.M.G.—Col. and Hon. Maj.-Gen. R. S. F. Henderson, C.B., ret. pay (late R.A.M.C.); Temp. Maj.-Gen. Sir B. E. Dawson, G.C.V.O., C.B., A.M.S.

K.B.E. (*Military Division*).—Capt. and Bt. Lt.-Col. (temp. Col.) Sir H. J. Stiles, Kt., R.A.M.C. (T.F.); Lt.-Col. W. Thorburn, C.B., C.M.G., R.A.M.C. (T.F.); Lt.-Col. E. N. Thornton, C.B.E., S. Afr. M.C.

To be Honorary Colonel.—Lt.-Col. A. E. Morris, ret. pay, late R.A.M.C.

The following statements of services for the awards recorded in THE LANCET of March 29th are announced:—

Bar to Distinguished Service Order.

Major ORVIL ARD ELLIOTT, D.S.O., Canad. A. Dental Corps, attd. 5th Fld. Amb., Canad. A.M.C.—For conspicuous gallantry and devotion to duty in the area forward of Iwuy, N.E. of Cambrai, on Oct. 11th, 1918. On hearing that there were two wounded men lying in a road in front of our lines he collected a party of bearers and led them forward under heavy fire. It was through his personal efforts and disregard of danger that the wounded, numbering eight, were successfully evacuated, and he was without doubt the means of saving their lives.

Capt. (acting Lieut.-Col.) WILLIAM ROSS GARDNER, D.S.O., attd. 138th Fld. Amb.—He was in charge of all forward medical arrangements of the division for the period Oct. 4th, 1918, to Oct. 26th, 1918, first in front of Gheluwe, and then both west and east of Courtrai. During the period in question, night and day, he visited the rear aid-posts, relay and forward collecting posts, often under heavy shell fire and gassing, in order to personally ascertain that the work of evacuation was proceeding satisfactorily. He showed great gallantry and ability, and his devotion to duty saved many lives.

Lieut.-Col. DANIEL PAUL KAPPELE, D.S.O., 5th Fld. Amb., Canad. A.M.C.—For conspicuous gallantry on Oct. 12th, 1918, in the vicinity of Iwuy, N.E. of Cambrai. He drove a car to the forward area through shell fire, which wounded him and others. He proceeded to dress the wounds of the others, directing and assisting in their removal to a place of safety. It was not until all were attended to and removed from danger that he allowed himself to be taken away and suffered his own wounds to be dressed. He showed great pluck and devotion to duty. (D.S.O. gazetted June 3rd, 1918.)

Lieut.-Col. THOMAS McCRAE LEASK, D.S.O., 10th Fld. Amb., Canad. A.M.C.—During recent operations in front of Cambrai he was given the task of clearing the wounded of a division. For five days on end he worked with untiring energy and absolute disregard for personal danger. On the night of Sept. 30th–Oct. 1st he, with the help of a near-by N.C.O. and one of the wounded drivers, succeeded in rescuing patients from a burning car, and had them immediately evacuated. His conduct throughout was admirable.

Distinguished Service Order.

Capt. (acting Lieut.-Col.) WILLIAM WALLACE BOYCE, No. 2 Fld. Amb., R.A.M.C.—For great gallantry, initiative, and resource in personally supervising the evacuation of casualties during the operations on Nov. 4th, 1918, near Petit Cambresis. He effected the rapid removal of wounded across the Sambre Canal under very difficult circumstances and considerable shell and machine-gun fire. On one occasion, when his advanced dressing station was blown in by shell fire, he personally reorganised his stetcher-bearers in a new site, inspired confidence in his officers and men, and undoubtedly saved many wounded under heavy fire.

Major ROBERT FULTON CRAIG, 15th Fld. Amb., Aust. A.M.C.—For conspicuous gallantry and devotion to duty in charge of the bearer division near Bellicourt, from Sept. 29th to Oct. 2nd, 1918. During the whole of this period he rendered valuable service, and by his coolness and initiative surmounted all difficulties under most trying conditions. He not only worked the evacuation of wounded from rear aid-posts of his own brigade, but he personally reorganised the evacuation from other brigades under very heavy shell and machine-gun fire.

Capt. (acting Lieut.-Col.) WILLIAM HILGROVE LESLIE McCARTHY, M.C., attd. 19th Fld. Amb.—During the operations connected with the crossing of the Sambre, Nov. 4th to 8th, 1918, he exhibited marked gallantry and devotion to duty. He was in command of the advanced dressing station and maintained the closest touch with the front-line troops, arranging for the immediate evacuation of casualties as they occurred. He worked continuously for three days and three nights, and his energy, able management, and devotion to duty saved many lives.

Temp. Capt. CLARENCE RANDOLPH YOUNG, M.C., attd. 1st Bn., Shrop. L.I.—On Sept. 18th, 1918, when the battalion had suffered very heavy casualties, he followed up and remained close behind the front line and in ground swept by the enemy's machine-gun fire, and exposed to artillery fire, spent the whole day tending and clearing the wounded; and on the following morning he went up, and, after spending some hours in No Man's Land, he got in several wounded men. By his gallantry and devotion to duty he undoubtedly saved many lives.

Second Bar to Military Cross.

Temp. Capt. (acting Major) GEORGE RANKINE, M.C., D.A.D.M.S., 9th Divn.—He was constantly with the fighting troops on Sept. 28th, 29th, and 30th, 1918, during the active operations, organising and assisting field ambulance bearers and regimental medical officers in establishing evacuation routes for the clearing of casualties out of the danger zone. He displayed great gallantry and devotion to duty near Deerlyck in this occupation, and his initiative and zeal saved many lives.

Bar to Military Cross.

Capt. JAMES EVERETT BARRY, M.C., Canad. A.M.C., attd. 2nd Canad. Bn., E. Ontario Regt.—For great gallantry and devotion to duty during the successful operations north of Bourlon Wood on Sept. 27th, 1918. Throughout he worked unceasingly under heavy fire from machine-guns and artillery. He made three trips to the outpost line to attend to wounded men. All wounded within the area fought over by this unit on Sept. 27th were cleared shortly after the objective had been gained.

Temp. Capt. MICHAEL CHARLES BURKE, M.C., attd. 2nd Bn., Dur. L.I.—In the operations in the vicinity of Holnon on Sept. 18th/24th, 1918, he displayed conspicuous gallantry and devotion to duty. Having dealt with all cases at his aid-post, he led out stretcher-bearers, and, under machine-gun and shell fire, collected more wounded. His search led him into an enemy-held trench, where he only desisted when bombed out. His efforts and his fine example were instrumental in saving many lives.

Temp. Capt. GEORGE MILNE CAMERON, M.C., attd. 65th (W. Lancs.) Fld. Amb.—From Oct. 23rd to 25th, 1918, during the heavy fighting about Ovillers and Polx du Nord, he, as bearer officer, showed the highest devotion to duty. He kept in constant touch with his R.A.P., and several times led bearer squads through intense shell fire to clear wounded. For 36 hours he worked without sleep and practically without food till the wounded were cleared. He saved many lives and showed great gallantry.

Capt. FREDERICK THOMAS CAMPBELL, M.C., Canad. A.M.C., attd. 8th Can. Bn., Manitoba R.—For great gallantry and devotion to duty. During the attack east of the Canal du Nord on Sept. 27th/28th, 1918, he continuously attended the wounded whilst exposed to severe enemy fire. On Sept. 29th, 1918, in an attack east of the Doual-Cambrai road, he worked coolly and fearlessly in the open for 14 hours. His fearless devotion to duty saved many lives.

Capt. HENRY CLARKE DAVIS, M.C., 10th Fld. Amb., Canad. A.M.C.—He was in charge of the evacuation of wounded from the forward area during the fighting in front of Cambrai, commencing Sept. 28th, 1918. He formed routes of evacuation under heavy machine-gun and shell fire. He guided parties of stretcher bearers in front of the regimental aid-posts at St. Olle and Sailly, and collected many wounded men. Throughout he showed great gallantry and devotion to duty.

Lieut. (temp. Capt.) WILLIAM HAIG FERGUSON, M.C., attd. 8th Bn., R. Berks. R.—For marked gallantry and devotion to duty. On Oct. 23rd, 1918, during the attack in front of Le Cateau, he was wounded in the left leg whilst attending to casualties. In spite of the wound he carried on attending to the wounded under a heavy barrage. Later, when his temporary dressing station was blown in by a gas shell, he assisted to extricate the wounded, who were in danger of suffocation.

Lieut. (acting Major) JAMES LA FAYETTE LAUDER, D.S.O., M.C., 138th Fld. Amb.—For conspicuous gallantry and marked devotion to duty during the operations, Oct. 14th to 20th, 1918, as Officer in charge Forward Bearer Officers of Brigades. He worked continuously, personally directing the evacuation of wounded from the regimental aid-posts east of Courtrai, wherever the casualties were heaviest, encouraging the bearers and setting a splendid example, under heavy fire, to those under him.

Capt. (acting Major) HERBERT BRUCE LOW, M.C., 2/2nd (North'bn.) Fld. Amb.—For conspicuous gallantry and devotion to duty. During the attack, Oct. 3rd to 8th, 1918, on Gouy and Le Catelet, he was in charge of bearers and forward posts. Whilst under considerable shell and machine-gun fire he went forward, visiting regimental medical officers, reconnoitring for forward bearer posts, and supervising the evacuation of wounded from the forward area, keeping up a complete chain of evacuation.

Capt. HARRY CLARKE MOSES, M.C., 5th Fld. Amb., Canad. A.M.C.—During the operations north of Cambrai, Oct. 9th, 1918, he was in charge of the stretcher-bearers evacuating the wounded of an attacking infantry brigade. He personally led his parties close behind the advancing infantry under severe shell and machine-gun fire. Owing to his fine example of cool courage and energy the evacuation of wounded from difficult and dangerous positions was rapidly accomplished.

Temp. Capt. JAMES CARTER OGILVIE, M.C., attd. 1st Bn., Bord. R.—For conspicuous gallantry and devotion to duty near Hoogemolen on Oct. 22nd, 1918. During an attack, when many regimental stretcher bearers had been knocked out by machine-gun fire, he organised a party of bearers and took them out himself, searched the ground for wounded, dressed them under very heavy fire, and evacuated them. He worked incessantly for a period of five hours, until every man had been dressed and evacuated.

Temp. Capt. JOHN RODGER, M.C., attd. 1st Bn., Bord. R.—For conspicuous gallantry and devotion to duty. During the attack, Oct. 3rd to 8th, 1918, on Gouy and Le Catelet, he was in charge of bearers and forward posts. Under considerable shell and machine-gun fire he went forward, visiting regimental medical officers, reconnoitring for forward posts, and supervising the evacuation of wounded from the forward area, keeping up a complete chain of evacuation. By his energy and zeal he saved many lives.

Capt. (acting Major) JAMES BETHUNE SCOTT, M.C., attd. 16th Fld Amb.—For conspicuous gallantry and untiring devotion to duty during operations near St. Quentin, between Sept. 18th/26th, 1918. He was bearer officer with the 16th Infantry Brigade. He personally kept touch with the R.A.P.'s in spite of heavy hostile machine-gun and rifle fire. It was mainly due to the skilful dispositions of his bearers that the wounded of this brigade were evacuated so speedily and satisfactorily.

Temp. Capt. DAVID CAMPBELL SUTTIE, M.C., attd. 1/2nd (N. Mid.) Fld. Amb.—Near Bohain he had charge of the bearers and bearer relay posts along the Bohain-Vaux-Andigny road during the attack on Oct. 17th, 1918. He used great skill and judgment in choosing his bearer posts, and also in keeping in touch with regimental medical officers in front. He set a fine example to his men by his fearless devotion to duty, and it was mainly through his efforts that the great majority of the wounded were brought in to the advanced dressing station.

Temp. Capt. GWELYM DAVID WATKINS, D.S.O., M.C., attd. 2nd Bn., W. Rid. R.—During the operations on Oct. 24th, 1918, on the high ground east of Verchain, he displayed great courage and devotion to duty in establishing his aid-post as close as possible behind the front-line troops. Very shortly after the first objective had been gained he proceeded to search for wounded with organised stretcher parties under continuous shell fire, and by his prompt attention and splendid organisation many lives were undoubtedly saved.

Temp. Capt. WILLIAM BROCKLE WILSON, M.C., attd. 1st Bn., Devon R.—For gallantry and devotion to duty during the operations near Bralstre, Oct. 20th to 23rd, 1918. During this period his battalion came under very severe enemy shell fire and a very severe gas bombardment. He worked unceasing for 36 hours in his R.A.P., where the gas was strong, and it was absolutely due to his pluck and inexhaustible energy that the evacuation of the casualties of two battalions was carried out without hitch.

The Military Cross.

Capt. LESLIE THOMAS ALSOP, 10th Fld. Amb., Austr. A.M.C., attd. 39th Bn., Austr. Inf.—On Sept. 29th, 1918, east of Ronssoy, he established an R.A.P. close to Gillemont Ruins, then held by the enemy, and, under heavy fire, tended the wounded. For 48 hours he was continuously at work organising stretcher parties and dressing the wounded.

Capt. JOSEPH RINGLAND ANDERSON, Austr. A.M.C., attd. 45th Bn., Austr. Inf.—For conspicuous gallantry and devotion to duty during the attack west of Bellenglise, north of St. Quentin, on Sept. 18th, 1918. During a protracted advance he established his R.A.P. well forward in the open, and continued with cool courage to attend the wounded under heavy shell fire. His efforts saved many lives.

Capt. (acting Major) HENRY MERRIL BARRETT, No. 2 Fld. Amb., Canad. A.M.C.—During Sept. 27th, 28th, 29th, 1918, he was in charge of clearing and evacuating wounded during Bourlon Wood operations. During this period he displayed cool courage under fire and keen devotion to duty, establishing his advanced dressing station close to advancing infantry, and making reconnaissances of forward roads under shell fire, thus enabling ambulances to get forward and save life.

Temp. Capt. HAROLD JOHN BENSTED, 140th Fld. Amb. (attd. 138th Fld. Amb.).—For gallantry and untiring energy during the period Oct. 16th to Oct. 20th, 1918, and attacks delivered in the neighbourhood of Courtrai. He personally directed the collection and evacuation of wounded from regimental aid-posts of different units. On one occasion he worked continuously for 48 hours, maintaining touch with regimental medical officers and forming new lines of evacuation of wounded under most difficult conditions of open warfare and rifle and machine-gun fire.

Temp. Capt. GIDEON ALBERTYN BEYERS, S.Afr. M.C., attd. 1st Bn., S. African Infy.—During the operations from Oct. 8th to 19th, east of Beaurevoir, and at Le Cateau, he showed great energy and gallantry in attending the wounded under heavy shell and machine-gun fire. On Oct. 8th he worked incessantly for nearly 24 hours attending to a very large number of cases. On Oct. 17th–18th he again did splendid work, and did not spare himself in any way, and was the cause of saving a great number of lives.

Capt. WILLIAM JOHNSTONE BINNS, Austr. A.M.C., attd. 33rd Bn., Austr. Infy.—For conspicuous gallantry and devotion to duty during the operations near Bony, from Sept. 29th to Oct. 2nd, 1918. Throughout he was untiring in his efforts, and worked with the greatest zeal. Altogether he established four different aid-posts, all close to our leading troops. He attended wounded in the open under heavy fire, and by his fine devotion to duty saved many lives.

Temp. Capt. GAVIN STIELL BROWN, attd. 1/4th Bn. Leic. R., T.F.—For conspicuous gallantry and devotion to duty whilst tending wounded on the morning of the attack of Sept. 29th, 1918, near Bellenglise, under very heavy shell fire. He showed an absolute disregard for personal danger, both at that time and subsequently during the action.

Temp. Capt. (acting Maj.) SAMUEL BURNSIDE BOYD CAMPBELL, 108th Fld. Amb.—For conspicuous gallantry during the attack east of Ypres on Sept. 29th, 1918, and subsequent days. He was in command of all the stretcher-bearers of the divisional field ambulance for 12 days, and the fact that all wounded were rapidly collected and cleared was largely due to his energy and efficient organisation. Throughout he showed fine devotion to duty.

Temp. Capt. JOHN SAWERS CLARK, attd. 15th Bn., R.I. Rifles.—For conspicuous gallantry and devotion to duty. On Oct. 14th, 1918, near Dadizeele, his aid-post was partially blown in and the entrance blocked. He at once set to work under shell fire and cleared the entrance and removed the wounded who were there to a safer place. Throughout he behaved splendidly in attending and helping the wounded under the most trying conditions at all times.

Temp. Capt. GEORGE OLIVER CONNELL, attd. H.Q R.E., 41st Div.—For marked gallantry and devotion to duty at Courtrai on the night of Oct. 19th/20th, 1918, when he went forward with a field company of R.E.'s to the bank of the River Lys, remained with them throughout the bridging operations, and though in an exposed position and subjected to intense enemy shelling, dressed the wounded, and by his fine devotion to duty saved several lives.

Capt. LAMBERT DOUGLAS DENSMORE, Canad. A.M.C., attd. No. 1 Fld. Amb.—For conspicuous gallantry and devotion to duty during the Bourlon Wood operations, Sept. 30th, 1918. He went forward to collect and evacuate considerable numbers of wounded who were lying in the vicinity of the Doual-Cambrai road, east of Heynecourt, and succeeded in evacuating them to the advanced dressing station.

Temp. Capt. CEDRIC LEWIS DOLD, attd. 1st Bn. S. Wales Bord.—Throughout the operations near Pontruet and Thorigny on Sept. 29th/30th, 1918, he carried out his work with great gallantry and devotion to duty. He constantly visited the front line under heavy machine-gun and shell fire to personally superintend the evacuation of the wounded, and never spared himself for a moment in anything that could promote the welfare of the battalion.

Temp. Capt. (acting Major) JAMES ANGUS DOULL, 103rd Fld. Amb., R.A.M.C.—For conspicuous gallantry and devotion to duty on Oct 14th, 1918, as divisional bearer officer. He personally directed the clearing operations, and, by his powers of organisation, successfully cleared over 400 casualties. He kept in close touch with all regimental aid-posts situated in the vicinity of Gheluwe and the area east of the village, conducted bearer reinforcements, and encouraged his detachment to further efforts under constant heavy shell fire.

Temp. Capt. (acting Major) STANLEY FENWICK, 16th Fld. Amb.—For conspicuous gallantry and devotion to duty during the operations near St. Quentin, Sept. 17th/26th, 1918. He was in command of a field ambulance which was evacuating from a divisional front. Under heavy shell fire he supervised the removal of patients to a place of safety, thereby saving many lives. He also visited all posts of the line by day and night, controlling and directing the bearers in their duties of evacuation.

Capt. ALBERT GRANT FLEMING, Canad. A.M.C., attd 4th. Canad. Inf. Bn.—During the attack of Sept. 27th. 1918, he displayed great gallantry and devotion to duty. He established his aid-post for the attack in the extreme eastern portion of Inchy within 400 yards of the enemy outpost line, and occupied this position during the night, despite a heavy high-explosive and gas bombardment, in order to be as close as possible to the attack.

Capt. (acting Major) WILLIAM DOUGLAS FREW, attd. 131st Fld. Amb.—For conspicuous gallantry and devotion to duty near Rambouilieux Farm on Oct. 20th, 1918. He was in charge of the bearer subdivision of his ambulance. Although his ambulance-car post was heavily shelled he kept it going during the day, supervising the bearing and loading of wounded. He also led parties of bearers through heavy fire along the ravine leading to Montay, getting wounded men through this way to the car post.

Temp. Capt. CODANDA MADIEH GANAPATHY, I.M.S., attd. Gren. I.A.—On Sept 20th, 1918, north-east of Selüt, he showed great gallantry in attending to the wounded under heavy artillery and machine-gun fire throughout the day, showing a complete disregard of personal danger. To his untiring efforts many men owe their lives.

Temp. Capt. GEORGE ALEXANDER CONNER GORDON, attd. Lond. R.—For conspicuous gallantry and devotion to duty during operations on Sept. 19th, 1918, near Sivri Tepe. As regimental medical officer he attended the wounded throughout the day, often under heavy fire. Though wounded, he continued to carry on until relieved on the morning of Sept. 20th, having covered a distance of over five miles on very rough ground. He set a fine example to those with him.

Temp. Capt. EDWARD HAROLD HERTSLET GRANGER, attd. 1st Bn. Leicester R.—Throughout the operations, Sept. 18th/26th, 1918, near Holnon, he was conspicuous for his gallantry and devotion to duty. On Sept. 18th, for an hour, during a heavy enemy artillery barrage, he attended to the wounded and assisted them to a place of safety. On Sept. 19th he established an advanced aid-post and attended to the severe and urgent cases throughout the day under heavy shell fire.

Temp. Capt. ZACHARIAH ALBERT GREEN, attd. 7th Bn., Wilts. R.—For great gallantry and devotion to duty during operations south of Le Cateau on Oct. 18th/19th, 1918. He continuously attended to wounded with the greatest skill and devotion to duty, and on several occasions under very heavy shell fire. His untiring energy, coolness, and total disregard of danger were admirable throughout.

Temp. Capt. ALFRED PURVIS HART, No. 2 Fld. Amb.—For great initiative, gallantry, and devotion to duty at the advanced dressing station, east of the church at Rejet-de-Beaulieu, during the exceptionally heavy bombardment on Nov. 4th, 1918. He repeatedly dressed wounded men and superintended the evacuation of casualties even when his dressing station was blown in by shell fire. He undoubtedly saved many lives.

Temp. Lieut. WILLIAM HICKEY, attd. 8th Bn., E. Surr. R.—For conspicuous gallantry and devotion to duty as battalion medical officer on Sept. 18th, 1918, near Ronssoy. Early in the attack he established his aid post at a main cross-roads and remained there for several hours under heavy shelling. He then went forward and attended to the wounded in the open wherever he could find them. His devotion to duty saved many lives.

Temp. Capt. ST. GEORGE MARRIOTT LESLIE HOMAN, attd. 1/8th Bn., Notts. and Derby R., T.F.—On Sept. 29th, 1918, during the attack on Bellenglise, he worked in an indefatigable manner, tending wounded in open trenches under heavy shell fire, showing disregard for personal danger, and moving his aid-post from time to time to be on the spot. Again, at the attack on Ramicourt and Montbrehain, on Oct. 23rd, he worked incessantly for 24 hours, tending to casualties from every battalion in the division, and, although badly gassed, he refused to relinquish his excellent work.

Temp. Capt. GEORGE JACKSON, attd. 15th Bn. Notts. and Derby R.—During operations on Oct. 14th, 1918, east of Terhand, he displayed great courage and devotion to duty in attending the wounded under close artillery and machine-gun fire. Throughout the whole day he was with the foremost wave of the battalion, and several times traversed the front line and dressed the wounded. Later, in Sweveghem, he again performed invaluable service in attending the wounded, and thereby saved many lives.

Capt. FREDERICK McNAB JOHNSON, Canad. A.M.C., attd. No. 2 Fld. Amb.—For conspicuous gallantry and devotion to duty. During the attack by the division on the Sept. 27th, 28th, and 29th, 1918, in front of the Canal du Nord, he was unremitting in his attention to wounded. Especially on Sept. 29th, he worked continuously under fire, locating and dressing wounded who were lying out, and superintending carrying parties.

Capt. ARTHUR POOLE LAWRENCE, 6th Fld. Amb., Austr. A.M.C.—He displayed great gallantry and able leader-ship on Oct. 3rd, 4th, and 5th, 1918, during the fighting in the Hindenburgh Line, North of St. Quentin, particularly during the assault on Montbrehain, as bearer Captain. He maintained touch with R.A.P.'s in spite of heavy shell fire, and his genius for selecting routes and loading posts resulted in a very rapid evacuation of wounded.

Temp. Capt. HENRY RUTHVEN LAWRENCE, 1st Fld. Amb., S.Afr. M.C.—For conspicuous gallantry and devotion during operations before Beaurevoir and Le Cateau, between Oct. 7th and 15th, 1918, whilst in charge of the collection and evacuation of wounded. On the 7th his organisation and energy were admirable, and from early morning on 8th to the evening of Oct. 9th he worked without rest, and the successful and expeditious evacuation of the wounded was due in a large measure to his tireless energy, resource, and disregard of danger.

Capt. GLADSTONE WILFRED LOUGHEED, 4th Fld. Amb., Canad. A.M.C.—In charge of stretcher-bearers during the operations north and east of Cambrai, Oct. 9th/12th, 1918, he displayed great energy and fearless devotion to duty. Particularly on Oct. 10th–11th, he worked continuously for 48 hours without rest. He time after time led his bearers to forward positions under severe severe shell fire, and was responsible for the rapid evacuation of the wounded from the field.

Temp. Capt. MALCOLM MANSON, attd. 10th Bn., R. W. Surrey R.—For conspicuous gallantry and devotion to duty near Menin on Oct. 14th, 1918. He went forward in the fog under heavy shell and rifle fire and established an aid-post, and continued dressing wounded under heavy shell fire at 1000 yards' range, quite regardless of his own personal safety. He showed marked coolness and courage throughout the whole operations.

Temp. Capt. ROBERT CHICHESTER McMILLAN, attd. 38th Bn., M.G. Corps.—For conspicuous gallantry and devotion to duty. On Nov. 8th, 1918, at A.D.S. Pot de Vin, he dressed and evacuated a large number of wounded continuously for 20 hours. For four hours of this period the enemy heavily shelled the A.D.S., one shell entering the building where he was attending the wounded, blowing out one of the walls.

Capt. ALLAN YOUNG McNAIR, Canad. A.M.C., attd. 10th Inf. Bn., Alberta R.—For conspicuous gallantry and devotion to duty east of Haynecourt on Sept. 27th/29th, 1918. He worked unceasingly for 48 hours in very exposed positions and under heavy fire. At one time he went forward and brought back a wounded officer who was lying out in front. His energy and fine behaviour throughout saved many lives.

Lieut. WILL GEORGE FREDERICK OWEN-MORRIS, attd. 2nd Bn., Leins. R.—For conspicuous gallantry and devotion to duty on Oct. 14th, 1918, near Ledeghem. Seeing a man fall wounded, he turned back, and for over half an hour remained working in a shell- and bullet-swept zone without any cover, attending to this man and others before himself moving to a pill-box a short distance away.

Capt. (acting Major) HARRY PRIEST RUDOLF.—At Fife Knoll, near Kh. Abu Felah, on Sept. 18th/19th, 1918, he remained out all night, under a heavy bombardment, attending the numerous wounded. Again, on Sept. 20th, he was indefat gable in his efforts, under shell and rifle fire, to collect the wounded. His gallant personal example cheered and encouraged not only the stretcher-bearers, but all ranks with whom he came in contact.

Temp. Capt. (acting Major) ROBERT BRYSON RUTHERFORD, 91st Fld. Amb., attd. 6th Div.—For conspicuous gallantry and devotion to duty during the night Oct. 8th/9th, 1918. On hearing that a congestion of stretcher cases had occurred at the regimental aid-post of the left brigade east of Montbrehain, he at once organised a party of bearers and dressers and proceeded in ambulance cars as far as the roads would allow. He then got in touch with the regimental medical officers, and under heavy shell fire organised the collection, dressing, and removal of the wounded to a place of safety.

Lieut. SOHAN LALL BHATIA, I.M.S., attd. Inf., I.A.—Near Sabieh, on Sept. 19th, 1918, for conspicuous gallantry under intense fire. The enemy put down a heavy barrage where he had established his aid-post. In the midst of this he carried out his work with an absolute disregard of his personal safety. The skilful way the wounded were dressed by him, in spite of the adverse conditions, afterwards elicited the admiration of the medical officers in the dressing stations.

Lieut. (temp. Capt. and acting Major) GERALD EVAN SPICER, 107th Fld. Amb.—He was in charge of a detachment of bearers during the operations around Moorseele from Oct. 14th/17th, 1918. He worked unremittingly throughout, establishing posts for the collection of wounded and going up to the regimental aid-posts, and on occasions forward of these posts, frequently under heavy shell and machine-gun fire. Owing to his gallantry and tireless devotion to duty the wounded were rapidly and successfully evacuated.

Temp. Capt. FREDERICK REGINALD STURRIDGE, attd. 2nd R. Sco. Fus.—From the commencement of the advance east of Ypres to Vichte he displayed great courage and devotion to duty. On the night of Oct. 13th/14th, 1918, at Slypsappelle, when the enemy put down a heavy barrage and caught two companies in the open, causing a large number of casualties, he immediately rushed his stretcher-bearers forward and established his aid-post where the casualties had occurred, in spite of the fact that it was in the open, and that the enemy was still shelling heavily. Throughout he behaved admirably.

Temp. Capt. (acting Major) CHRISTOPHER SULLIVAN, 75th Fd. Amb.—He was in charge of the advanced dressing station during the action at Beaurevoir on Oct. 5th, 1918, when over 300 cases were passed through his post. He was very short-handed, but by his personal courage and devotion to duty he animated all ranks and successfully evacuated the wounded under very heavy shell fire.

Temp. Capt. EDWARD COWPER TAMPLIN, attd. 9th Bn., Sco. Rif.—During continuous operations east of Ypres, from Sept. 28th to Oct. 26th, 1918, he has carried out his duties with conspicuous success as battalion medical officer. He has never failed to get all wounded expeditiously evacuated, frequently under heavy fire. His fearless devotion to duty has been an inspiring example to all who have worked with him.

Capt. JAMES THOMPSON, attd. 2nd Bn., Bedf. R.—During the operations near Preux-au-Bois, on Nov. 4th, 1918, he showed great coolness and devotion to duty in attending to wounded under heavy machine-gun and shell fire. Entirely disregarding his own personal safety, he moved about among the wounded, attending to men of all units, and by his untiring energy he was instrumental in saving many lives. He has always set a very fine example to stretcher-bearers and others working under him.

Temp. Capt. WILLIAM TUDHOPE, 17th Fld. Amb.—For conspicuous gallantry and devotion to duty near St. Quentin on Sept. 18th/19th, 1918. He was in charge of a section of bearers and brought them up under very heavy shell and machine-gun fire. He got in touch with the battalion and cleared their wounded soon after zero hour. He continued throughout the whole day and following night to supervise the evacuation of the wounded until this was accomplished.

Temp. Capt. (acting Major) ALEXANDER WILMOT ULOTH 132nd Fld. Amb.—He showed great gallantry and untiring devotion to duty whilst in command of bearers during the operations from Sept. 29th to Oct. 1st, 1918, near Bellicourt. At a very critical period, and when casualties were heavy, he successfully organised relay posts and led a party of bearers during the night Sept. 29th/30th to a position in the line whence he was able to carry out an immediate evacuation of the wounded.

Temp. Capt. ROBERT WILLIAM LESSEL WALLACE, attd. 9th Bn., R. Surrey Regt.—For great gallantry as regimental medical officer. On the night Oct. 8th/9th, 1918, when the enemy counter-attacked at Niergnies during a relief, he remained out during the night in what had then become "No Man's Land," tending the wounded after most of his staff had become casualties. Again, on Oct. 16th, when his aid-post received several direct hits, he carried on his work where best he could in close proximity to the enemy. Thanks to his fine devotion to duty throughout, a large proportion of wounded were brought in.

Capt. RENÉ EDWARD AMOS WESTON, Canad. A.M.C., attd. 2nd Canad. Fld. Amb.—For conspicuous gallantry and devotion to duty. On the morning of Sept. 27th, 1918, near Bourlon Wood, he came into a heavy barrage in order to dress the wounded. This is only one of several examples of the manner in which he performed his duty. His absolute disregard of personal safety is admirable.

Capt. (acting Major) MICHAEL WHITE, No. 1 Fld. Amb.—For conspicuous gallantry and devotion to duty when in command of brigade stretcher-bearers on Oct. 17th/18th, 1918, near La Vallee Mulatre. Undeterred by enemy fire, he kept in close touch with the battalions, frequently visited their aid-posts, and maintained the steady and rapid evacuation of all casualties. His coolness and resource inspired his men and his skilful leading undoubtedly saved many lives.

Capt. HENRY PARKS WHITWORTH, attd. 6th Bn., K.O.S.B.—For marked gallantry and devotion to duty near Cuerne on Oct. 16th/17th, 1918. In spite of heavy shell fire he showed utter disregard of his personal safety in tending the wounded. Twice his aid-post was hit by a shell, but he carried on and performed most valuable work in dressing the wounded until he was seriously wounded.

Capt. EDWARD ALBERT WOODWARD, 8th Fld. Amb., Austr. A.M.C., attd. 29th Bn., Austr. Infy.—At Bellicourt during Sept. 29th/30th, 1918, with his R.A.P. in an open trench under heavy shell and machine-gun fire, he carried on day and night dressing and attending the wounded. He showed a total disregard of danger and untiring devotion to duty under the most trying conditions, working without rest for 48 hours.

ROYAL NAVAL MEDICAL SERVICE.

Surgeon Lieutenants to be Surgeon Lieutenant Commanders: A. R. Sharrod, J. S. Elliot, A. E. Panter, G. S. Harvey, W. H. Murray, G. H. Hayes, H. C. A. T. Cannon.

To be Surgeon Lieutenant: A. F. Grimbly.

ARMY MEDICAL SERVICE.

Temp. Col. Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S. (Lieut.-Col., R.A.M.C. T.F.) (Major, ret. I.M.S.), relinquishes his temporary commission on re-posting.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. C. Garner (retired) is granted the rank of Colonel on ceasing to be re-employed.

To be acting Lieutenant-Colonel whilst specially employed: Temp. Capt. (acting Major) W. N. Parker.

Major W. M. Power, from the Half Pay List, retires on retired pay.

Majors relinquishing the acting rank of Lieutenant-Colonel on ceasing to command a Medical Unit: G. F. Rudkin, T. H. Scott, W. K. Beaman.

The undermentioned relinquish the acting rank of Lieutenant-Colonel: Temp. Major E. F. Eliot, Capt. C. H. Stringer, Temp. Capt. F. G. W. Deane (to revert to the acting rank of Major).

Temp. Capt. G. Clarke to be acting Lieutenant-Colonel whilst specially employed.

Major (acting Lieutenant-Colonel) P. Dwyer relinquishes the acting rank of Lieutenant-Colonel.

Capt. P. Carney relinquishes the acting rank of Major on re-posting.

Capt. J. Sainsbury resigns his commission.

The undermentioned relinquish the acting rank of Major on ceasing to be specially employed: Capt. and Bt. Major J. D. Kidd, Temp. Capts. W. V. Robinson, A. L. Lockwood, D. J. Glenn, A. L. Krogh (on re-posting).

To be acting Majors whilst specially employed: Temp. Major H. D. Gillies, Capts. A. L. Foster, C. D. K. Seaver, Temp. Capts. G. Marshall, B. G. Brooke, E. F. Bashford.

Temp. Capt. and Bt. Major H. F. Marris and A. W. Rattrie relinquish the acting rank of Major.

Capt. L. B. Clarke, from T.F., to be Captain.

The undermentioned Captains, from Spec. Res., to be Captains: R. R. G. Atkins, J. Stephenson, K. A. Maclean, C. L. Balkwill, C. W. Sparks, H. Alcock.

Capt. A. W. Raymond resigns his commission.

The undermentioned to be temporary Captains: H. W. Fox, late temporary Captain; A. H. Priestley, late temporary Captain; E. H. Jones, late temporary Captain; G. W. M. Smith, late Captain, Can. A.M.C.; J. J. Clarke, late temporary Captain.

Temporary Lieutenants to be temporary Captains: R. L. Wilcox, F. A. Stokes, E. L. Morgan, R. H. Wace, S. G. Platts, J. N. Turnbull A. J. Beattie, R. F. Higgin, B. G. Reynolds, G. H. Winch.

Temp. Hon. Lieut. B. D. Brooker to be temporary honorary Captain.

To be temporary Lieutenants: W. M. Bristow, W. A. Slack, W. F. Gardener.

Officers relinquishing their commissions: Temp. Lieut.-Col. S. C. Elgee (and retains the rank of Lieutenant-Colonel); Temp. Major (acting Lieut.-Col.) J. Russell (and is granted the rank of Lieutenant-Colonel); Temp. Capts. (acting Majors, granted the rank of Major) E. Tawse, W. G. Waugh, J. Donald; Temp. Capt. (acting Major) R. C. MacQueen (retains the rank of Captain); Temp. Capts. (granted rank of Major) R. T. Grant, J. L. A. Grout, T. E. Coulson; Temp. Capts. (retaining the rank of Captain) A. L. McCreery, K. M. Walker, G. James, R. H. Stevens, C. S. Dodson, F. W. Diamond, J. F. Hammond, R. S. Dobbin, J. J. Middleton, J. M; Young, W. Fraser, E. G. Howell, R. H. Adams, F. E. S. Willis, J. Dick, R. L. Kitching, G. B. Archer, H. T. Lippiatt, H. G. M. Henry, J. W. Grice, G. I. Moriarty, G. S. Terry, B. W. Skinner, F. L. Thomas, W. N. Soden, W. MacKenzie, S. G. Askey, H. H. Mathias, T. Kelly, R. W. B Gibson, L. Crombie, A. T. McWhirter, C. J. Young; Temp. Lieuts. N. S. MacNaughton (retains the rank of Lieutenant), H. W. Hackett.

Canadian Army Medical Corps.

Temp. Capt. (acting Major) A. B. James relinquishes the acting rank of Major.

Temp. Majors J. R. McRae and D. A. Murray retire in the British Isles.

Canadian Army Dental Corps.

Temp. Capt. E. J. Kelly retires in the British Isles.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: W. A. Coutts, M. J. Cahalane, H. A. Cochrane, A. B. S. Drysdale, R. P. Jack, D. MacColl, R. J. Peters, F. L. Heap, F. A. Prosser, G. Gordon, T. B. Moyes, E. M. E. Cumming, W. R. D. Hamilton, J. Irving, W. R. McLinden, W. A. Jaques.

TERRITORIAL FORCE.

Majors (acting Lieutenant-Colonels) relinquishing the acting rank of Lieutenant-Colonel on ceasing to be specially employed: A. E. Hodder, G. Mackie, J. Bruce.

Capt. (acting Lieut.-Col.) D. C. L. Fitzwilliams relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

Captains (acting Majors) relinquishing the acting rank of Major on ceasing to be specially employed: R. G. Walker, E. L. Forward, O. K. Wright, A. P. Watson, A. M. Young, J. W. Scott, J. A. Morris, C. E. Whitehead.

Capt. (acting Major) H. H. B. Cunningham relinquishes the acting rank of Major on vacating appointment as Deputy Assistant Director of Medical Services.

To be acting Majors whilst specially employed: Capts. A. M. Young, A. P. Watson, and C. N. Kidston.

2nd Northern General Hospital: Capt. (acting Major) C. W. Vining relinquishes the acting rank of Major on ceasing to be specially employed.

2nd Scottish General Hospital: Lieut.-Col. C. W. Cathcart is restored to the establishment.

2nd Southern General Hospital: Capt. J. A. Nixon is restored to the establishment on ceasing to hold a temporary commission in the Army Medical Service.

3rd Western General Hospital: Capt. (acting Major) W. J. Greer relinquishes the acting rank of Major on ceasing to be specially employed.

2nd London Sanitary Company: Capt. (acting Major) A. G. G. Thompson relinquishes the acting rank of Major on ceasing to be specially employed. Lieut. P. G. MacGregor to be Captain.

ROYAL AIR FORCE.

Medical Branch: Lieutenants to be Captains: J. P. Hosford, G. W. J. Bousfield, A. St. J. Hennessy.

Major H. F. Horne relinquishes his commission on ceasing to be employed, and is granted the rank of Lieutenant-Colonel.

The undermentioned are transferred to unemployed list: Capt. J. C. Hall, Lieuts. D. Pennington, S. G. Smith.

INDIAN MEDICAL SERVICE.

Col. J. B. Smith is appointed an Honorary Physician to the King, vice Col. J. Crimmin, V.C.

Lieutenant-Colonel to be Colonel: P. J. Lumsden.

Major to be Temporary Lieutenant-Colonel: W. H. D. Stevenson.

Temporary Lieutenants to be temporary Captains: J. H. Barrett, Ratan Chand Sondhi, Kalidas Bagchee, Amolak Ram, Homi Edulji Variava, Mangalore Narsing Rao, Nallicherry Samasundara Nataraja Sastri, Bindiganavali Ramaswamy Iyengar, Padupurackal Thomas Zacharias, Naranammalpuram Sankarsaiyar Ramaswami, Jagadispada Dutta, Kisory Mohan Ghose, Kiyattle Kannan Nambyar, Ramapurath Thimman Thomas, Maneck Nusserwanji Dubash, Shankar Dhando Karve.

The King has approved the relinquishment of temporary rank in the Indian Medical Service and Indian Defence Force of Capt. C. E. R. Norman.

Indian Defence Force.—P. A. Hayne to be temporary Captain.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
A Text-book of Surgery for Dental Students. By G. P. Mills, B.S. Lond., and H. Humphreys, B.D.S. Birm. 2nd ed. Pp. 340. 14*s*.

BAILLIÈRE, TINDALL, AND COX, London.
The Principles of Gynæcology. By W. Blair Bell, B.S., M.D. Lond. 3rd ed. Pp. 660. 38*s*.
Aids to Materia Medica. By A. E. Collie, R.A.F. Medical Service. Pp. 116. 3*s*.

BALE, JOHN, SONS AND DANIELSSON, London.
On Facial Neuralgia and its Treatment. By J. Hutchinson, F.R.C.S. Pp. 216. 15*s*.
The Amœbæ Living in Man. By C. Dobell, F.R.S. Pp. 155. 7*s*. 6*d*.

HODDER AND STOUGHTON, London, New York, and Toronto.
Reminiscences of Three Campaigns. By Sir A. Ogston, K.C.V.O. Pp. 336. 16*s*.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the quarterly examination in Practical Pharmacy, held on Oct. 9th, the following candidates were approved:—

Elizabeth Emma Arkwright, London Sch. of Med. for Women; E. J. Bilcliffe, St. George's Hosp.; J. L. M. Brown, St. Bart.'s Hosp.; I. J. Corbett, London Hosp.; F. P. de Caux, St. Bart.'s Hosp.; Helen Mary Du Buisson, Charing Cross Hosp.; P. Elman, Manchester Univ.; J. C. Evans, London Hosp.; Blanche Sutton Gardner, Royal Free Hosp.; H. Geary, Manchester Univ.; Marion Greaves, Leeds Univ.; F. Guiver, London Hosp.; H. G. Hall, Univ. Coll. Hosp.; E. R. Hughes, London Hosp.; Sophie Elizabeth Hymans-de-Tiel, Royal Free Hosp.; F. J. Jauch, Middlesex Hosp.; M. Jayakar, Univ. Coll. Hosp.; R. Lee-Michell, Middlesex Hosp.; F. G. Lewtas, Cambridge Univ. and St George's Hosp.; C. A. Lindup, Univ. Coll. Hosp.; Elizabeth McKerrow, Royal Free Hosp.; M. S. Mahmud, Liverpool Univ.; G. G. Newman and F. F. Petersen, London Hosp.; Violet Rapson Harding Rains and Mary Frances Roope, Charing Cross Hosp.; C. V. D. Rose, Univ. Coll. Hosp.; J. J. Rowlands and J. Solomonoff, London Hosp.; J. A. Stephens, Leeds Univ.; D. R. Thompson, London Hosp.; B. N. Tonkin and T. W. Turner, Guy's Hosp.; H. S. Ward, Leeds Univ.; Effie Adela Wharton, St. George's Hosp.; and N. W. Wood, Middlesex Hosp.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—The two Goldsmid Entrance Exhibitions, offered annually for competition in September, were awarded this year to Mr. J. H. Porter and Miss E. M. Turner, both of Cambridge University.

OLD STUDENTS' DINNERS.—The University College Hospital old students' dinner, postponed from Oct. 3rd, is to be held on Friday, Oct. 31st, at the Imperial Restaurant, Regent-street, at 7 for 7.30 P.M.—The St. George's Hospital dinner is announced for Nov. 26th at Prince's Restaurant, Piccadilly, at 6.30 for 7 P.M., Dr. J. H. P. Fraser presiding.—The St. Thomas's Hospital dinner, postponed from Oct. 1st, will take place at the Connaught Rooms, Great Queen-street, W.C., on Wednesday, Jan. 14th, 1920, at 7 o'clock for 7.30. The chair will be taken by Sir George Makins.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—A meeting of this association was held on Oct. 7th at 11, Chandos-street, W.—The annual report was read.—Mrs. E. E. Flemming, M.D., who was elected President for the ensuing year, gave an address on the Future of the Association, in which she referred to some of the work done by the London Association in the past, and discussed the need for its continued existence. She said that inasmuch as in the near future the number of medical women would be largely increased, the need for association and union with regard to the interests of fellow workers might be even greater than now. Women were favourably placed for research in that their practice was, as a rule, narrowed to the care of diseases of women and children only, and the very fact of their observation being directed to one part of the community alone should enable women to achieve more eminence on their special lines. One great advantage of the London Association was that women were connected with those practising on different lines, whereas other medical societies were frequently either split up into sections or gatherings of specialists. The London Association had in the past done some work in the investigation of such subjects as menstruation and the menopause, and important results might be hoped for with increasing numbers. In this connexion Mrs. Flemming reminded the society that the cause and means of prevention of such a common pathological condition as uterine fibroids were still unknown. After a reference to the interaction of the various parts of the body and the influence of the endocrine glands, she concluded by the suggestion that association was not merely herd instinct, which was fellowship of an exclusive and "fearsome" kind; there could be a fellowship of those who had a common education for a common aim. All scientific discoveries took place by the pressing forwards of many units each with a little more vision, until one among them received that sudden illumination which enabled all to move forward with a great stride.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on Oct. 9th, with Sir Francis H. Champneys in the chair.—A letter was considered from the Ministry of Health stating (*a*) that the Ministry had taken steps to lay the representation as to the modification of the constitution of the Central Midwives Board before both Houses of Parliament; (*b*) that the Ministry approves the proposal of the Board to grant war bonuses to its secretary and assistant secretary. The Board directed that the letter be received.—A letter was considered from the clerk of the

London County Council enclosing for the Board's approval a draft letter which the County Council proposes to send to midwives practising in the County of London on the subject of midwives acting in coöperation with medical practitioners. The Board decided that the draft letter of the London County Council be approved.—A letter was considered from the Ministry of Health drawing the Board's attention to the number of deaths which have recently taken place at the nursing home conducted by a certified midwife and to the conditions under which she trains her pupils. The Board decided that the Minister of Health be informed that (1) the Board will consider any information which may be brought before it concerning the deaths of the children referred to, provided that such deaths occurred as a result of breaches of its rules; (2) the Board will take into consideration the condition of the premises in question at which pupils are trained and take any action in its power.

At a special meeting held on the same day three midwives were struck off the roll, the following charges, amongst others, having been brought forward:—

The midwife did not take and record the pulse and temperature of her patients at each visit, as required by Rule E. 14; she did not enter records of the pulse and temperature of her patients in a note book or on a chart, carefully preserved, as required by Rule E. 14; with intent to deceive the inspector of midwives she recorded pulses and temperatures purporting to be those of her patients, when in truth and in fact no such pulses or temperatures had been taken by her, and she did not keep her register of cases as required by Rule E. 24. Being in attendance at a confinement, and the patient suffering from illness, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 20; medical aid having been sought for the patient she neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (*a*).

NATIONAL BABY WEEK COUNCIL.—A meeting of the Council will be held at the Armitage Hall, 224, Great Portland-street, London, W., on Tuesday, Oct. 21st, at 3 P.M. Addresses will be given by Captain Reiss on Housing as it Affects Infant Mortality, and Dr. C. W. Saleeby on Alcohol and Infancy.

Obituary.

ARTHUR NEVE, F.R.C.S. EDIN.

THE sudden death on Sept. 5th of Dr. Arthur Neve, of the C.M.S. Hospital in Kashmir, will be felt not only by the district in which, and the society for which, he worked, but by many friends in this country who were associated with him as an officer in the R.A.M.C.

Arthur Neve was born at Brighton in 1858 and educated at the grammar school there and at Edinburgh University, where he qualified in 1880, becoming F.R.C.S. Edin. four years later. In the year after qualification he entered the service of the Church Missionary Society, going to Kashmir, where five years later he was joined by his brother Ernest. The devotion and strenuous energy of these two resulted in the Kashmir Hospital becoming known throughout India as a model of efficient work. The younger medical missionaries who came into touch with Arthur Neve as the president of the Medical Missionary Society of India or as the secretary of the Medical Missions subcommittee of the C.M.S. in the Punjab, were encouraged to spend part of their annual vacation in hospital. In this way the surgical and administrative efficiency of the model institution were reflected in far distant mission hospitals.

Dr. Neve was one of the early recipients of the Kaisar-i-Hind gold medal for public service in India. He had himself a great love for that country; his non-technical publications include books on mountaineering in India and guides to Kashmir, which bear witness to the fact that he was a keen and fearless mountaineer, besides being a cultured artist and musician. Early in the war he returned to England, obtained a temporary commission as major in the R.A.M.C., and did valuable work—first at the hospital for Indian soldiers in Brighton and later as surgical divisional officer in the War Hospital at Dartford. During this period he found time to prepare an interesting communication on "Gunshot Wounds of the Knee-joint with Septic Arthritis."[1] He also commented upon a case resuscitated by heart massage recorded by Captain T. C. Bost.[2] He returned to resume his work in Kashmir only six months ago.

[1] THE LANCET, 1918, ii., 353.
[2] THE LANCET, 1918, ii., 583.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ADRIAN, J., M.B., B.S. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Killough District of the county of Down.

FELDMAN, W., M.B., B.S. Lond., Senior House Physician at the Prince of Wales's General Hospital, Tottenham.

GORDON, M. H., M.D., Bacteriologist to St. Bartholomew's Hospital, and Lecturer on Bacteriology in the Medical School.

GUTHRIE, D., M.D., F.R.C.S., Surgeon to the Ear and Throat Department, Royal Hospital for Sick Children, Edinburgh.

LANCASTER, E. LE C., M.B., B.Ch. Oxon., Consulting Physician to the Swansea General and Eye Hospital.

Victoria Hospital for Children, Chelsea: WYARD, S., M.D., M.R.C.P. Lond., and INGLEBY, HELEN, M.B., B.S., M.R.C.P. Lond., Physicians to Out-patients.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, Vauxhall Bridge-road, S.W.—Hon. Asst. S. H.S. £100. Clin. Assts. Hon. Radiologist.
Beckenham Education Committee.—School Dent. £400.
Bedford County Hospital.—Res. M.O. £150.
Birkenhead Borough Hospital.—Hon. Gynæcologist.
Birkenhead and Wirral Children's Hospital, Woodchurch-road.—H.S. £150.
Birmingham General Hospital.—H.P. £100. H.S. £125.
Birmingham and Mid and Ear and Throat Hospital.—Asst. S.
Bolingbroke Hospital, Wandsworth Common, S.W.—S. Also Res. M.O. and H.S. £200 and £150.
Bournemouth, Royal Victoria and West Hants Hospital.—Bact. Labor. Asst.
Bradford Royal Infirmary.—H.S. and H.P. Each £200.
Bridge of Weir, near Glasgow, Consumptive Sanatoria of Scotland.—Asst. R.M.O. £200.
Bristol Education Committee.—Asst. School M.O. £500.
Burnley, Victoria Hospital.—H.S. £250.
Burton-on-Trent Infirmary.—H.S. £210.
Cancer Hospital Free, Fulham-road, London, S.W.—Asst. S.
Canning Town Women's Settlement Hospital, Plaistow, E.—Female Hon. Asst. S.
Central London Ophthalmic Hospital, Judd-street, W.C.—Hon. P.
Charing Cross Hospital, Agar-street, W.C.—Dent. S.
Chelmsford, Essex Education Committee.—School Med. Inspcts. £400.
Croydon County Borough.—Clin. Tuberc. O. £550. Also Asst. M.O.H., Maternity and Child Welfare Work. £500.
Derby, Derbyshire County Council.—Tuberc. O. £500.
Dewsbury and District General Infirmary.—H.S. £250.
Didworthy, South Brent, Devon and Cornwall Sanatorium.—Asst. M.O. £200.
Dorchester. Dorset County Council Education Committee.—School Dentists. £400.
Dudley County Borough Education Committee.—Asst. School M.O. and M.O.H. £500.
Dumfries, Crichton Royal.—Asst. P. £350.
Dundee District Asylum.—Asst. M.O. £325.
Ealing Borough.—Asst. M.O.H. £500.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.P. £125. Res. M.O. £200. Radiologist. £100.
East Riding Education Authority.—School Dent. £400.
East Suffolk and Ipswich Hospital.—P.'s, Asst. P.'s, S.'s, Asst. S.'s, Gynæcologist, a.O.'s in Charge of X Ray and Electro-Therapeutic Dept. and Anæs. Also H.P. £250.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Female Obstet. Asst. £50. Also R.M.O., House of Recovery, New Barnet. £60. Also Clin. Assts.
Evelina Hospital for Children, Southwark, S.E.—Hon. Phys. for Skin Dept. Also Hon. Dent. Surg.
Exeter City.—Asst. M.O.H. and Asst. Sch. M.O. £400.
Gibraltar.—Asst. Colonial S. £450.
Glasgow, Woodilee Mental Hospital, Lenzie.—Asst. M.O. £300.
Gloucester County Asylums.—Jun. Asst. M.O. £300.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Asst. S.
Great Northern Central Hospital, Holloway, N.—Obstet. P. Dent. S.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. M.O. £200. Also Two Anæs. £15 15s.
Huddersfield County Borough Education Authority.—Asst. School M.O. £400.
Huddersfield Royal Infirmary.—Asst. H.S. £100.
Hull, City and County of Kingston-upon-Hull.—Res. M.O. £450.
Ipswich, East Suffolk and Ipswich Hospital.—H.P. £250.
Leicester Royal Infirmary.—Asst. Ven. Dis. Dept. 6 guineas p.w.
Liverpool Education Committee.—Asst. Sch. M.O.'s. £350.
Liverpool Royal Southern Hospital.—Two H.S.'s. £100.
Manchester, Ancoats Hospital.—H.S. £100.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—H.S.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Asst. S. Also Clin. Assts.
Metropolitan Hospital Kingsland-road, E.—Asst. S. Also Pathologist and Registrar. £120.
Mount Vernon Hospital for Consumption or Diseases of the Chest, Northwood, Middlesex.—Asst. R.M.O. £200.
National Hospital for Diseases of the Heart, Westmoreland-street, London, W.—Res. M.O. £100. Also Non-Res. M.O. £50.

Newport, Mon., Royal Gwent Hospital.—Three Res. M.O.'s £225, £200, and £180 respectively.
North Riding of Yorkshire County Council Education Committee.—Asst. Sch. M.O. £450.
Norwich, Norfolk Education Committee.—Asst. School M.O. £400.
Nottingham General Dispensary.—Res. S. £300.
Nottingham General Hospital.—H.S. £150.
Oldham Royal Infirmary.—Third H.S. £200.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £200.
Portsmouth Corporation Mental Hospital.—Asst. M.O. £300.
Rhondda Urban District Council.—Dist. M.'s £400.
Richmond, Surrey, Royal Hospital.—H.S. £150.
Rochdale Infirmary and Dispensary.—Junior H.S. £125.
Royal Chest Hospital, City-road, E.C.—Asst. P.'s.
Royal Waterloo Hospital for Children and Women, S.E.—Hon. Ophth. S.
St. Bartholomew's Hospital.—Asst. Director of Surgical Unit. £750.
Sheffield Royal Hospital.—Res. Asst. Cas. O. £120.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. £100.
Sunderland Royal Infirmary.—H.P. £200.
Swansea General and Eye Hospital.—H.S. £250. Also Female R.M.O. £200.
Wakefield, West Riding County Council.—Dist. Tuberc. O.'s. £600.
Warrington County Borough.—Asst. M.O.H. £450.
West Bromwich and District Hospital.—Res. H.S. £200.
Westminster Hospital, opposite Westminster Abbey.—Surg.
Winchester, Royal Hampshire County Hospital.—Hon. Pathologist.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Wicklow.

Births, Marriages, and Deaths.

BIRTHS.

CALEY.—On Oct. 11th, at Ellerton-road, Wandsworth Common, the wife of F. G. Caley, M.A., M.B., of a son.
ELMSLIE.—On Oct. 8th, at Ventnor, I.W., the wife of R. C. Elmslie, M.S., F.R.C.S., Portland-place, W., of a son.
GRIFFITH.—On Oct. 7th, at Roydon, Torquay, the wife of Harold Griffith, F.R.C.S., of a son.
LOUGHNAN.—On Oct. 9th, at Ealing, the wife of Major W. F. M. Loughnan, M.C., R.A.M.C., of a son.
MORIARTY.—On Oct. 2nd, at Pembroke, the wife of Major T. B. Moriarty, D.S.O., R.A.M.C., of a daughter.
PLOWRIGHT.—On Oct. 10th, at King's Lynn, the wife of Charles T. MacL. Plowright, M.B., B.C., of a daughter.

MARRIAGES.

HODGSON—GILLAM.—On Oct. 8th, at St. Philip's Cathedral Church, Birmingham, by the Rev. G. B. Cole, B.A., Albert Ernest Hodgson, M.D., D.P.H., City Hospital, Fazakerley, Liverpool, son of John Hodgson and the late Mrs. Hodgson, of Glanagulle, Coalham, Redcar, to Nora Crelna Gillam, daughter of the late John Gillam, of Penrhyn, Stourbridge, and of Mrs. Gillam, Stourbridge.

DEATHS.

MACKENZIE.—Died at Glenoran, Inverness, on Oct. 11th, Dr. Finlay Matheson Mackenzie, aged 77 years.
MESSER.—On Oct. 11th, at Eastbourne, Adam Brunton Messer, Inspector-General of Hospitals and Fleets, R.N., M.D., K.H.P., aged 81 years.
ORD.—On Oct. 14th, at Eastlands, Basingstoke, George William Ord, M.R.C.S., L.R.C.P., eldest son of the late George Rice Ord, M.R.C.S., L.R.C.P., and late of Richmond, Surrey, and Bexhill-on-Sea, in his 57th year.
SINCLAIR.—On Oct. 11th, at Mortonhall-road, Edinburgh, Surgeon-General David Sinclair, C.S.I., I.M.S., retired.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Oct. 21st.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship. (Names already circulated.)

Thursday, Oct. 23rd.

OCCASIONAL LECTURE: at 5.30 P.M.
Dr. Frederick L. Hoffman (Newark, New Jersey): The Methods and Results of National Health Insurance.

MEETINGS OF SECTIONS.

Friday, Oct. 24th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—E. A. Cockayne, H. C. Cameron, C. P. Lapage): at 4.30 P.M.
Epidiascope Demonstration:
Dr. F. G. Crookshank: Hand Prints of Children, including Mongolian Imbeciles.
Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—William Butler, M. Greenwood): at 8.30 P.M.
Paper:
Major W. Byam, R.A.M.C.: Epidemiology of Trench Fever.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 21st.—4.30 P.M., Demonstration of Pathological Specimens. Cases sent for Consultation. Exhibition of Clinical Cases by Dr. J. L. Bunch, Dr. S. Kapoor, Dr. E. J. D. Mitchell, Dr. W. Griffith, Dr. W. K. Sibley, and the President. 5 P.M., Paper:—Dr. F. H. Humphris: The Melted Paraffin Wax Bath with especial Reference to Chilblains.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE, in the Clinical Theatre of the Hospital.

A Special Course of Instruction in the Surgical Dyspepsias will be given by Mr. A. J. Walton:—

MONDAY, Oct. 20th.—4.30 P.M., Lecture XXIII.:—Symptoms and Treatment of Acute and Chronic Pancreatitis.

FRIDAY.—4.30 P.M., Lecture XXIV.:—Visceroptosis and Appendix Dyspepsia.

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Room of the Institute, 37, Russell-square, W.C.

Course of Instruction for Candidates as Tuberculosis Officers, General Practitioners and others. Bacteriological Demonstrations will be given in the Laboratories of the Institute, and visits arranged to Sanatoriums, Tuberculosis Dispensaries, &c.

THURSDAY, Oct. 23rd.—5 P.M., Lecture III.:—Dr. C. Wall: The Selection of Patients for Sanatorium Treatment.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.

WEDNESDAY, Oct. 22nd.—4.30 P.M., Lecture:—Dr. R. A. Young: Prognosis in Cases of Pulmonary Tuberculosis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, Oct. 21st.—Lecture:—Dr. E. S. Reynolds: The Diagnosis of Affections of the Spinal Cord.

Communications, Letters, &c., to the Editor have been received from—

A.—Mr. M. T. Avashia, Junagad; Army Medical Service, Director-General of; Messrs. Arnold and Sons, Lond.
B.—Dr. H. O. Butler, Lond.; Dr. A. E. Barclay, Manchester; Mr. R. Blair, Lond.; British Hospital for Mental Disorders and Nervous Diseases, Lond.; Mr. G. Bethell, Lond.; British Anti-Tobacco and Anti Narcotic League, Manchester, Gen. Sec. of; Sir J. Bland-Sutton, Lond.; Surg.-Commdr. C. S. W. Bunton, R.N.; Mr. P. Barter, Lond.; Dr. J. P. Buckley, Manchester; Mr. R. Burges, Hartley Wintney.
C.—Mr. P. Cooper, Lond.; Mr. J. F. Colyer, Lond.; Dr. F. G. Cawston, Durban; Capt. J. P. Cullen, R.A.M.C.(T.); Dr. R. Crawfurd, Lond.; Messrs. Cassell and Co., Ltd., Lond.; Dr. H. Chambers, Lond.; Dr. R. Cruchet, Bordeaux.
D.—Sir D. Duckworth, Lond.; Dr. W. A. Daley, Bootle; Mr. H. Dickinson, Lond.; Dr. R. Dudfield, Lond.
E.—Dr. W. Ewart, Lond.; Messrs. Evans, Sons, Lescher, and Webb, Liverpool; Mr. G. S. Elliston, Lond.
F.—Factories, Chief Inspector of; Capt. H. J. B. Fry, R.A.M.C.(T.)
G.—Dr. A. D. Gardner, Rugeley; Great Northern Central Hospital, Lond., Sec. of; Mr. M. P. Gabe, Merthyr Tydvil.
H.—Harveian Society of London; Hospital for Women, Lond., Sec. of; Hazell, Lond., Editor of; Dr. C. T. W. Hirsch, Lond.; Mr. T. Hennessy, Dublin; Mr. S. Hastings, Lond.; Dr. F. de H. Hall, Lond.; Dr. C. O. Hawthorne, Lond.; Mr. T. D. Harries, Aberystwyth.
I.—India, Secretary of State for, Lond.
K.—Dr. H. C. Kidd, Bromsgrove; Dr. W. Kidd, Cheltenham; Prof. A. Keith, Lond.; King's College Hospital Medical School, Lond., Sec. of; Dr. T. N. Kelynack, Lond.
L.—Sir Henry S. Lunn, Lond.; Dr. R. Lowry, Lond.; Dr. H. Lankester, Lond.; Capt. N. S. R. Lorraine, R.A.M.C.; Dr. E. C. Lewis, Lond.; Mr. V. W. Low, C.B., Lond.; City of London, Town Clerk of; London Dermatological Society, Hon. Sec. of; Messrs. E. and S. Livingstone, Edinburgh; Prof. R. T. Leiper, Lond.; London School of Tropical Medicine.
M.—Dr. L. Minter, Brighton; Mr. J. W. McCarthy, Lond.; Ministry of Health, Lond.; Middlesex Hospital, Lond., Sec.-Supt. of; Mr. D. M. MacLeod, Evesham; Medical Officers of Schools Association, Lond.; Mr. A. R. Mahood, Bristol; Mr. W. A. Maas, Lond.
N.—National League for Health, Maternity, and Child Welfare, Lond., Sec. of; National Safety Council, Chicago; Dr. H. B. Newham, C.M.G., Lond.; Capt. F. J. Naftrass, R.A.M.C.(T.); National Association for the Prevention of Tuberculosis, Lond., Sec. of.
O.—Col. M. D. O'Connell; Capt. F. A. Osborn, R.A.M.C.
P.—Messrs. Pathé frères, Lond.; Profiteering Act Department, Lond., Mr. N. Patterson, Lond.; Dr. J. J. Perkins, Lond.; Capt. F. D. Parbury, St. Helier's.
Q.—Queensland, Registrar General of, Brisbane.
R.—Dr. J. D. Rolleston, Lond.; Dr. C. Russ, Lond.; Dr. W. C. Rivers, Worsboro' Dale; Mr. R. P. Ratnakar, Manchester; Royal College of Surgeons of England, Sec. of; Dr. H. W. B. Ruxton, Lond.
S.—Prof. W. Stirling, Manchester; Save the Children Fund, Lond., Sec. of; Dr. A. G. Shera, Eastbourne; St. Thomas's Hospital, Lond., Sec. of; Society of Medical Officers of Health, Lond.
T.—Dr. A. L. Taylor, Liberton; Mr. G. M. Trevelyan, Berkhamsted; Mrs. A. Tourtel, Lond.; Triplex Safety Glass Co., Lond.
U.—University of St. Andrews.
V.—Village Centres Council, Lond., Sec. of.
W.—Sir Bertram Windle, Cork; Dr. R. Worth, Lond.; War Office, Lond., Publicity Dept.; Mr. W. E. Wilson, Lond.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

THE OFFICER IN CHARGE OF A MEDICAL DIVISION.[1]

BY ADOLPHE ABRAHAMS, M.D., M.R.C.P.,
MAJOR, R.A.M.C.; OFFICER I/C. MEDICAL DIVISION, THE CONNAUGHT HOSPITAL, ALDERSHOT; ASSISTANT CONSULTING PHYSICIAN TO THE ALDERSHOT COMMAND.

PART I.

NOBODY can write of an official position he has occupied without identifying himself, to some degree at any rate, with his hero; but although I must necessarily draw upon my own experience, I wish at the outset to disclaim any personal applications of my observations.

Types of Divisional Officers.

The divisional officer may be everything or nothing in his hospital. He may be one of those relatively placid persons whose key-note in life is that blessed word administration, or that still more blessed word organisation; who sits in an office generously provided with clerks, decides to which of his subordinates are to be allocated certain duties, issues corresponding directions, signs his name on the necessary occasions—and that is all. Or he may be a restless, intense sort of creature, excessively active and energetic, and in a perpetual state of tension; himself so conscientious and aware of his own capabilities that he has little faith in the conscience or capacity of others, and most unwilling to delegate any duty of importance. Both types, it is almost unnecessary to point out, will make unsatisfactory divisional officers, and the ideal will be a man of balance occupying a position somewhere between the administrator or the performer, tending, as his instincts and abilities permit, in one or other direction. The officer in command of a medical division should also be the best general physician in the hospital, with a capacity both to recognise when a special opinion upon some feature is necessary and to criticise and use this opinion.

A Day's Work.

It is manifest that, were this all, the selection of a physician of sound experience would meet the case; but in a military hospital innumerable details go towards the efficient organisation of hospital routine. In order to give some impression of these I propose to follow the divisional officer through a rather strenuous, but still a reasonably typical, day's work.

He will arrive at the hospital shortly after 9 A.M., and at once find himself plunged into a maelstrom of responsibilities and anxieties. A variable number of cases admitted during the night by the orderly officer and kept under observation are swiftly transferred to appropriate permanent wards, for the guiding principle for an observation ward is that it should be almost always empty. In the vast majority of cases a broad distinction between serious and trivial cases is sufficient as a temporary "diagnosis," but ever before him is the fear of overlooking an early case of, for example, measles or scarlet fever, or that most insidious of all diseases, cerebro-spinal fever. The admission of one of these to a general ward means quarantine for perhaps a fortnight, with the delay of some five-and-twenty men fit for duty, and consequent inquiries and reprimands. A few minutes are then snatched for official correspondence—the ideal divisional officer must have no private cares, worries, affections, or responsibilities; his division must be father and mother, wife and child to him—and then in a sort of overwhelming flood come an indefinite number of urgent requests and appeals converging from every quarter of the command outside the hospital as well as from within.

Consultations.

The officers in charge of the different wards are anxious for a consultation upon their most serious cases. One has a man who is blanched to an alarming degree of anæmia from a gastric ulcer, a second is uncertain whether a case with violent headache has or has not the dreaded spotted fever. In a third ward is a patient with symptoms suspicious of some acute surgical condition, and the question of transference to a surgical colleague is urgent. A fourth officer is solicitous about the critical state of his pneumonia patients, whilst a fifth has his wards blocked with a bad batch of chronics or undiagnosed cases, and has sent out the S.O.S. to enable him to get clear. But in the meantime two officers have been sent in from a distance for a specialist's opinion; the president of the Standing Invaliding Board urgently requires the presence of an expert upon a difficult case; the matron has two sick nurses whom she particularly wishes to be seen at once; and clerks are waiting with the list of a hundred expeditionary force men who arrived in the small hours of the morning and who must be seen with the least possible delay, so that the diagnosis of their conditions, and to a considerable extent their prognosis, may be telegraphed to an impatient War Office. But, nevertheless, the commanding officer must receive attention first. He is fuming over some complaint—he receives querulous complaints every morning. It may be that Lady Bountiful's V.A.D. hospital is nearly empty, and she must receive five-and-twenty relatively convalescent patients to-morrow. She particularly desires that they must be nice men, and wishes to point out that of the last batch Pte. Smith did something or other and Gunner Jones something else, and so five-and-twenty eminently desirable blue-clad warriors must be found for her.

Complaints.

Something much more serious may be in the air; one of the inevitable complaints about the inhuman or inadequate treatment of some inmate has been sent to the War Office, and an explanation is demanded and must be produced at once; or the complaint may be a purely local one. The auditors point out that we are consuming more than our legitimate allowance of bread, or somebody else is appalled at the awful consumption of drugs. And by this time a neurotic staff officer has dropped in to see a doctor, and although there is no such thing officially as a medical specialist, still he must be accommodated with what passes unofficially as an expert, and only the tact and special capacity developed by the necessity of doing 60 minutes' work in every hour can put a stop to the recital of his symptoms and send him away silenced, if not satisfied. And, indeed, of this there is urgent need, for Lieutenant Robinson is sick this morning and has just telephoned that he is not coming, and his wards must be attended to. A unit some miles out must be instantly supplied with a medical officer. Captain Brown is going away on leave on account of urgent private affairs, and a substitute must be provided. (Incidentally, it may be noted that whenever an officer wants to get away he manages somehow to convey the impression that his duties can easily be performed by anybody handy who has an odd ten minutes a day to spare; when, however, it is suggested that he can add somebody else's duties to his own, one gathers that Hercules with all his labours enjoyed a very soft time in comparison.) Dovetailed into the more solid details of the morning's work are a large and interesting variety of classifiable and unclassifiable emergencies, all of which are submitted to the divisional Pooh-Bah. He is expected to have at his finger-tips Army Council Instructions, which undergo frequent—sometimes revolutionary—changes. Thus, quite apart from the broad details applying to British troops, colonial patients demand disposal upon lines laid down by their own authorities, and opportunities for giving offence by a disregard of special requirements are manifestly frequent. Furthermore, like most generalisations, A.C.I.'s seem to take a fiendish pleasure in applying to every sort of case except the one under consideration. Certain circumstances demand not merely all the official knowledge, but often all the ingenuity, casuistry, and eloquence which the divisional officer can command. "What disease am I to call a man sent back from France to have a new glass eye fitted?" will not be answered by an appeal to the Official Nomenclature of Diseases, nor will the same manual afford much assistance in the classifying of a patient sent home to have some alterations made to a surgical boot! He may even be called upon to decide to whom a corpse legally belongs!

Further, there are the perpetual grievances and complaints from all and sundry, who regard the divisional officer as an inexhaustible fount of sympathy and discretion as well as an intermediary to higher powers. And if he is fitted to survive, the divisional officer learns how he must mollify one and coax another, persuade a third and flatter a fourth, play on the vanity of some and the conceit of others, find a way to persuade both parties in a dispute that both are in the right, and if he should be so unfortunate as personally to be engaged in a difference of opinion, get his own way whilst letting the other believe that he is getting his.

And so the morning goes on, and the divisional officer is enjoying the mental experiences of a Cinquevalli juggling simultaneously with a cannon ball and a small pellet of paper; but by 1 o'clock the turmoil dies down, the rest of the hospital retires to its well-earned mid-day meal and subsequent leisure, and he is left to deal with the motley crowd who have been sent up to see the medical specialist, so that in lieu of other forms of recreation and refreshment he can turn now, with hope of being uninterrupted, to what may be termed his out-patient department.

[1] Abridged from a paper read before the Aldershot Command, Medico-Chirurgical Society.

THE NATION'S TOBACCO BILL.

THE compilation of the nation's consumption and expenditure on tobacco for the years 1917 and 1918, just published by the British Anti-Tobacco League, affords interesting reading. It shows, at all events, a remarkable increase in tobacco indulgence through a period when the shadows of war were darkest, and this in spite of a decided advance in the cost of the commodity. The total expenditure for the two years reached no less a sum than £242,490,000. The consumption of tobacco in 1918 increased over 1917 by 12,623,100 lb., or by 8·29 per cent., while the extra cost was £34,214,900, or 34·37 per cent. Of course, it is the League's business to insist upon the injurious effects of tobacco smoking and its pernicious influence on the national health and well-being, and they instance the cases of excessive tobacco smoking by the soldier, by the engine driver, and by women, in which impairment of health due to the habit is attributed. "Has the nation gone mad over tobacco?" it is asked. It is idle to deny, of course, that excessive tobacco smoking is mischievous, but the remedy rests with the individual. Smokers, generally speaking, are well aware when they are exceeding the bounds of endurance consistent with the preservation of health, and they must exercise a restraint over the habit, just as with many other habits capable of being pushed to a danger point. Juvenile smoking is much to be deprecated, and women seem to show less restraint than men in regard to tobacco indulgence. Smoking amongst women has been lately on the increase, and the custom is universally tolerated where years ago it was looked upon as a daring and offensive act upon the part of women. The popularity of the cigarette is largely responsible for this. It would be interesting to ascertain what proportion of the increase in the nation's indulgence in tobacco is due to women smokers. The war has undoubtedly been responsible for an increased appeal to the peculiar sedative effects of the cigarette, the pipe, and the cigar, and women during the war have felt as much as men the need of a sedative. Tobacco smoking is harmful in relation to the dose and the manner in which it is practised (inhalation is most reprehensible, for example); age, and perhaps sex, are factors concerned in its toxic possibilities, but over-smoking can be counteracted by voluntary restraint.

"WITH APOLOGIES TO MOORE."

IN view of the proposal to make the profession of medicine a trade-union society certain lines have been written by "Paddy" under the above title. The author reserves the right of publication, so that we must content ourselves with quoting five lines:—

"Let medicine remember the days of old,

. . . . . .

When her leaders with standard of fame unfurl'd,
Led her members along with honour,
Ere the greed of pelf and party's self
Brings her down to the rank of trader."

There is no doubt of "Paddy's" views upon the trade-union question, but some doubt if he has chosen a medium for the expression of those views which suits his pen.

DISABLED MEN AS PUBLIC VEHICLE DRIVERS.

THE Committee appointed by the Home Secretary last December to review the decisions regarding the licensing of partially disabled men as motor drivers has now issued its report, in which it has not varied its previous recommendations except as regards eyesight. It recommends that no man with only one eye should be allowed to drive a public vehicle, and that for all other men a regular standard of ocular efficiency should be introduced, a high one for all new entrants, and a lower one for all those who have been continually licensed for three years or more. It proposes also that the licensed man should in future be required to submit every five years a medical certificate as to eyesight.

Within the last three months there have been eight motor-bus accidents in the London district, resulting in two fatalities and many casualties. Recently at an inquest held in Southwark on a woman who was knocked down by a motor cab, it was given in evidence that the driver had probably been insane for two years. These facts all suggest the importance of the examination for mental and physical fitness of all drivers, as well as of disabled men, and, what is more, the advisability of periodical medical reinspection as to their continued fitness for the work. Whether it is a result of war worry, or want of correct judgment due to shell shock, or of recklessness acquired by driving military vehicles under war conditions, there is certainly an increase in the number of accidents. The addition in number of passengers and the insufficiency of bus room for them, do not, we trust, mean a too rigid time-table, causing the drivers to economise time at the expense of safety by taking risks. Motor drivers might with advantage take as their maxim that of Juvenal: "No delay can be too long, when a man's life is at stake."

MEDICAL MEN AS "COMMERCIAL USERS."

To the Editor of THE LANCET.

SIR,—In your issue of last week your correspondent "Inner Tube" suggests that tyre manufacturers should offer doctors and veterinary surgeons commercial users' rates, and gives very good reasons for such suggestions. He states that he is unaware of any firm who gives our profession this recognition.

I have, however, for the past 18 months obtained my tyres from a firm who make an allowance of 20 per cent. to medical men, and, apart from this reduction in price, have had great satisfaction from their tyres. The firm is the Stelastic Tyres, Ltd., 14 and 16, Garway-road, Westbourne-grove, London, W. 2.—I am, Sir, yours faithfully,

Brighton, Oct. 11th, 1919. LEONARD MINTER.

To the Editor of THE LANCET.

SIR,—May I say, in reply to "Inner Tube's" query of Oct. 11th, that the Kempshall Tyre Co. of Europe, Ltd., 97 and 98, Long Acre, W.C. 2, allow medical men the 15 per cent. discount granted to commercial users.

I am, Sir, yours faithfully,

Brentford, Oct. 11th, 1919. H. W. B. RUXTON, M.B.

*** Since the publication of "Inner Tube's" communication we learn that other firms have considered the matter favourably.—ED. L.

MYCOLOGICAL METHODS OF DETECTING SUGAR IN URINE.

REVERSIBLE reactions, common enough in bio-chemical tests, are too often used in practice in one direction only. In connexion with an annotation on Pentosuria (THE LANCET, July 19th, p. 117) our attention has been drawn to the interesting work of Dr. Aldo Castellani and Dr. F. E. Taylor on the mycological detection of certain carbohydrates in urine. When ordinary chemical methods fail or are not in place pentose or any other sugar can be detected by a delicate differential fermentation test. On the reliability of commercial yeast the authors throw some doubt. No exhaustive knowledge of bacteriology is required to carry out the tests, the authors giving a list (*Journal of Tropical Medicine and Hygiene*, July 1st, 1919) of the fungi and bacteria to be employed.

A SLEEPING CAP.

Mr. A. C. Wilson, M.R.C.S., L.R.C.P., has sent us a specimen of a sleeping cap, which, he says, has been successful in inducing sleep in certain cases of insomnia that have come under his notice. From an elastic band, 2 in. wide, which passes round the head at the forehead level, four pads depend, two to cover the eyes and two to cover the ears. These pads are kept in place by a tape which connects all four of them, and fastens behind the head, and the whole device is steadied by a band attached to the forehead band and passing over the head from before backwards. Although the cutting off of external stimuli undoubtedly conduces to sleep, some patients may object to the pressure of the head band, while others may feel uncomfortable through the heat-holding properties of the device, which is covered with wash-leather. Personal idiosyncrasy with regard to the conditions most suitable to sleep vary, and while one may receive comfort from the old-fashioned night-cap another will obtain benefit by turning his pillow over, thus obtaining a cool surface upon which to lay his head. The makers are Messrs. Allen and Hanburys, and the price of the invention is from 15*s.* to 21*s.*

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